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# LECTURES

ON

# BLOOD-LETTING;

DELIVERED AT

THE GENERAL DISPENSARY,

ALDERSGATE STREET.

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# LECTURES ON BLOOD-LETTING.

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## LECTURE I.

### GENERAL OBSERVATIONS ON BLOOD-LETTING.

We are now, gentlemen, approaching a subject of paramount interest and importance—one which merits, and I doubt not will receive, your closest attention. I mean, the use of *blood-letting*, as well for the prevention, as the removal of disease. From the earliest times this remedy has been extensively employed; and at no period, perhaps, has it been held in higher estimation, or more frequently resorted to, than in the present day; one might naturally expect, therefore, that a pretty general agreement in opinion would be found among practitioners with regard to it. This, however, is far from being the case; opinions are still vague and unsettled on the subject, and, in some respects, contradictory; while the merits of the practice, as far as I am able to judge, are by no means justly or sufficiently appreciated. I know of no greater service that could be rendered to the healing art, and, consequently, to society at large, than the assigning, with tolerable certainty and precision, the various circumstances that ought to influence us in the use of this herculean remedy. The task of doing this, however, is one of no ordinary kind; and, indeed, as I believe, not to be perfectly accomplished by any individual. In offering myself to you, therefore, as a guide on this occasion, I am not unaware of the difficulty, nor of the importance of the undertaking; but it is an essential part of the duty I owe you, and I shall perform it as well as I am able. This I will venture to say, after a long and pretty extensive acquaintance with diseases and their treatment, and after as frequent a use of blood-letting as has perhaps fallen to the lot of most others;—that it is a remedy both safe and efficacious on a great number of occasions in which it is not commonly resorted to, while, on the other hand, it must be confessed that it is sometimes employed without sufficient judgment and discrimination; to the no small injury of the patient.

The importance of blood-letting, as a *medicinal* agent, in comparison with other means of cure, is shown in various respects. It is a remedy the most frequently called for in general practice; and often, of itself, and without the aid of other means, accomplishes all we wish. In point of efficiency, none will bear a comparison with it; while it is one for which, on numerous occasions, no adequate substitute can be found. It is prompt in its effect, so as to be adapted to many cases of great and sudden emergency. The danger of misapplying it, too, is not to be disregarded; and this is another circumstance that adds to the importance of the subject. Lastly, it is the least equivocal of remedies; its good effects, when properly administered, are, in most cases, so immediate and striking as not to be mistaken. This can, with truth, be said of few other of our curative means; which, except with regard to those of the simplest operation, seldom accomplish what they are supposed to do. In short, blood-letting is a remedy which, when judiciously employed, it is hardly possible to estimate too highly. There are, indeed, few diseases in which, at some periods, and under some circumstances, it may not be used with advantage, either as a palliative or curative means. A great number of diseases are speedily brought to a termination by the early use of this remedy, which, without it, are apt to run a protracted course; thereby inflicting much, and unnecessary, suffering on the patient. On various occasions, life itself is brought into immediate hazard by the neglect of this essential means of cure; and still oftener does it happen that, by such neglect, a foundation is laid for chronic maladies, of different descriptions, that are not less fatal in their result, though the termination is sometimes so remote that the primary affection is apt to be lost sight of: a large proportion of the fatal cases of what is called *decline*, or pulmonary consumption (a disease so destructive among all ranks in the present day, and that at the most interesting period of human life), is clearly traceable to this source—the neglect of early blood-letting; all other means being of trifling import compared with this. Dropsies, too, and *confirmed asthma*, as it is called, and a hundred other chronic maladies that render existence miserable, and ultimately destroy life, are often referable to the same neglect.

But, if I wished to excite your attention in the strongest manner to this subject, namely, the necessity of a prompt and vigorous application of the remedy in question, I would mention those inflammatory affections of the brain that are so common in early life; in boys and girls, for instance, between the ages of six and twelve more especially, though such affections are not confined exclusively to any age. From violent exertions in play, or other causes of excitement, and perhaps exposure to the mid-day sun, the patient is first found complaining of slight headache. He loses his appetite, complains of thirst, is languid and spiritless; his sleep is scanty and disturbed, and all application to his usual studies becomes irksome to him. Such cases are of frequent occurrence in seminaries for education, and attract, for a time, but little notice. If sickness and vomiting occur, as is often the case, the patient is said to be bilious, and this at once solves the difficulty—a dose of some family purgative is administered, preceded, as a matter of course, by a blue-pill, or a few grains of calomel (for these, you know, in the language of the day, are *good for the bile!*) Now, such treatment is correct, as far as it goes, for it is generally proper to exhibit evacuants at the commencement of such attacks; but how often does it not happen that, after the lapse of two or three days of fancied security, the fire, which was at first but barely kindled, blazes out with unrestrainable fury. The cheeks are flushed; the pain in the head becomes acute and throbbing; light and noise are intolerable to the patient; the fever grows intense (brain fever); utter sleeplessness follows, and this is at length succeeded by delirium, which often ends but in fatal stupor. This is a scene you will probably be called upon frequently to witness hereafter—more frequently, I fear, than you will be able to counteract the evil; for the time for acting with effect has, perhaps, gone by, and is not to be recalled. But what cannot be cured when confirmed, may often be prevented by the use of prompt and active means at the outset of the disease. This, above all others, is a case in which the maxim, *principiis obsta*, holds good. You should be extremely watchful and attentive to all cases of this description. You should do too much, rather than too little. It is better even to apprehend danger, where possibly none exists; for, by so doing, you will best consult the safety of your patient. In such cases, an early bleeding, that is, within a few hours of the attack, at the same time that it is perfectly safe, will rarely fail to put an immediate stop to the disease; whereas, by waiting two or three days, as is often done, in the hope that the disorder will subside without this remedy, and trusting, in the meantime, to saline draughts, and other equally trifling and inefficient medicines, the disease may have gone beyond the power of art to arrest its progress. You must ever bear in mind that the tendency to violent inflammatory affections of the brain is peculiarly strong in early life, and the progress of the mischief rapid; and that nothing is half so effectual in arresting their course as early blood-letting. If, in such subjects, the slightest of the symptoms I have mentioned be observed to linger on from day to day, not yielding quickly and perfectly to quiet, abstinence, and mildly aperient medicines, you ought at once to take alarm, and have recourse to the great—I might almost say the only—remedy against the growing evil. In laying down your plan of cure in these cases, as indeed in most others, your first inquiry should be, is bleeding requisite, or even likely to become so? for in either case it should be at once resorted to. Blood-letting, more than other remedies, requires to be well-timed. It is always the more effectual the sooner it is had recourse to, insomuch, that although it may be highly proper at first, it becomes equivocal after a time, and often positively injurious.

By acting with such promptitude and decision you must expect occasionally to encounter opposition, and perhaps obloquy. You may be accused of acting with unnecessary vigour in cases that might possibly have terminated favourably by other and apparently milder means. But you can never know beforehand, at least with any thing like certainty, that this will be the result in any individual case. When such a disease as *inflammation*, and that of an acute kind, arises in organs of importance to life—as the brain, the lungs, or the heart, and which experience tells us often leads to danger—and, as the same experience proves, is best controlled by blood-letting—we are not justified in withholding the most effective, and often, indeed, the only remedy, merely because we are not sure that, in the particular instance before us, the disease may not give way to other and milder means. It is not without a feeling of regret that I now look back on some cases of this description, where, from yielding to the prejudices of others, in opposition to my own judgment, at a time, however, when I felt less confident on the subject than I now do, a means of cure has been withheld, that might, not improbably, have arrested the progress of a fatal malady. I might, with justice, extend these remarks to other forms of disease as well as the *brain-affections* of young people: but I have said enough, I trust, to ensure your attention to so important a matter.

I would here inculcate on you the absolute necessity of acquiring the requisite facility and dexterity in the use of the lancet, and which can only be attained by frequent practice. As general practitioners you are liable to be called upon, daily and hourly, to administer this remedy, and you should be able to do it with confidence, and without timidity. This is by no means a superfluous suggestion on my part; for, simple and easy as the operation of bleeding appears to be, and is in reality, to the greater number of practitioners, there are still not a few, to whom, either from timidity or want of frequent use, the proper performance of it is a matter of difficulty and uncertainty. The consciousness of this naturally begets a reluctance to employ it, and it is often omitted in consequence, in cases that really require its use. An aversion, which is quite natural on the part of the patient, to the employment of a measure that has something revolting in its appearance, is now and then fostered, I fear, by the practitioner; not altogether from any doubt of its propriety and fitness, but on the less excusable ground of the difficulty experienced in the performance of the operation.

Formidable and objectionable, however, as blood-letting may appear to those who are imperfectly acquainted with it, it is, in reality, less painful and far milder in operation; and, I may add, when used with judgment and discrimination, safer also in its effects, than many other remedies that are resorted to without hesitation, as substitutes for it. Drastic purgatives, blisters, calomel, and other forms of mercury, that are in such general and almost indiscriminate use in the present day in the treatment of fevers and inflammations, are, generally speaking, infinitely inferior to blood-letting in point of efficacy, while they occasion much greater and more present and lasting suffering to the patient. Convalescence, or the restoration of strength after the termination of disease, is sooner accomplished where the cure has been effected chiefly by bleeding (always supposing, of course, that this is the appropriate remedy, and that it has been used with judgment) than where it has been brought about by those miscalled milder means. The reason of this is obvious:—in the former case the organs of nutrition are left, on the termination of the malady, in a sound and natural condition, ready and able to resume their various offices when no longer disturbed by the presence of the disease; while in the latter, by the daily-repeated use of drastic medicines, those organs (by the agency of which alone the strength can be recruited) are left in a state of weakness and disorder, from which they are often very long in recovering.

It is no small commendation of blood-letting, in comparison with other means of cure, that it tends, when judiciously employed, to supersede, and render unnecessary, a vast heap of drugs, which are often worse than useless; seldom effecting the purpose for which they are administered, and which by no means merit the implicit confidence placed in them by a credulous public, who, if they knew the vast proportion of instances in which diseases subside spontaneously, without the aid of medicine, would be less disposed than at present to yield their confidence to ignorant pretenders to the art. The great and crying evil of the present day is what I would denominate super-medication—an over-weening fondness for, and an unreasonable belief in, the power of drugs, improperly termed medicines—many of which, by their deleterious properties (for we have forced into the service, of late, the whole tribe of poisons, from arsenic to the prussic acid), interrupt the natural course of diseases, so as to make it impossible, in many cases, to distinguish between the effects of the medicine and those of the disease itself. I do not scruple to tell you that I am one of those who think that greater simplicity in prescription, and less of mystery in the practice of our art, are required both for the most successful administration of it, and for the character of its professors, than have yet found favour amongst us, but which a more enlightened state of the public mind will infallibly produce.

What I have hitherto said you are to consider as merely introductory. I wished, in the first place, to excite your attention strongly to by far the most important agent we possess for the removal of many of the most dangerous forms of disease. The subject altogether is of great extent, and requires to be placed in different points of view, each of which calls for, as it undoubtedly merits, the fullest consideration. It is only by proceeding in this way, in fact, that the advantages of the practice can be either sufficiently known or appreciated, or the cautions that are absolutely necessary for its safe administration be clearly understood. We shall have to notice its effects on the system in health as well as in disease; to describe and point out the various circumstances which influence its employment, the mode or modes in which it may be supposed to operate in the removal of disease; in other words, the theory of the subject—the different methods in use for abstracting blood from the system for medicinal purposes, with the relative advanges and disadvantages of each; and lastly, its particular application to diseases; involving, of course, the inquiry into its necessity or indispensability in particular cases, with the signs or indications that call for and justify its employment, as well as those that limit or forbid its use, and the injurious consequences that may result from its misapplication; the auxiliary aid it admits of; and the substitutes that may be found for it. It is only by proceeding in this way that the advantages of the practice can be sufficiently known or appreciated, or the cautions that are absolutely necessary for its safe administration be clearly understood. The circumstances which are to govern us in the employment of blood-letting are both numerous and various; and it would be wholly unjustifiable on my part to recommend the practice to your favour for adoption, without at the same time impressing on you the absolute necessity of carefully weighing the circumstances of each individual case that comes before you. General rules are of little service on these occasions. You may be told, for example, that bleeding is a remedy for inflammation; and so it is, in numberless instances, and that where all others are of little avail; but if it be not applied with due regard to time, degree, and various other circumstances, it will do injury rather than good.

You see, then, gentlemen, that a field of great extent is open before us, which calls for no small share of time and labour for its successful cultivation. You must be prepared to follow me in detail, and not shrink from the task, arduous though it may be. By so minute a study of the subject, and by this alone, will your labour be rewarded. With minds so imbued, you will resort to the remedy with confidence, where others feel nothing but doubt and hesitation.

A few remarks on the *history of blood-letting* will not, perhaps, prove uninteresting to you. Should it be your wish to follow out this part of the subject more in detail, I would refer you to the *Histoire de la Médécine* of Le Clerc; a work of great credit, and which will furnish you with a clue to most of the principal ancient writers. Sprengel has probably given us the most complete history of the subject; unless we choose to give that credit to Dr. Carol. Fred. Nopitsch, a physician of Nuremburg, who published, in 1833, a Chronological and Systematic Account of Blood-letting, from the earliest times. He cites no less than thirty writers before the Christian æra, and 710 from that period to 1830.

## LECTURE II.

### HISTORY OF BLOOD-LETTING.

It is not my intention on the present occasion, gentlemen, to enter with much minuteness into the *history* and *origin* of *blood-letting*.

Such a discussion, though not without interest, is rather a matter of curiosity than of practical use, and would needlessly consume time that is already too limited for our purpose. It would be a fruitless task, indeed, to seek to discover when blood-letting was first introduced into the practice of medicine. Like most other branches of the healing art, its origin is involved in impenetrable darkness. It is certain, however, that the practice is of great antiquity, and was in general use long before the time of Hippocrates, the earliest writer on medicine whose works have reached us, and who flourished considerably more than 2000 years ago. Hippocrates appears, from his various writings, to have been familiarly acquainted with phlebotomy, or venesection, and also scarification, both with and without cupping. On different occasions he advises opening the veins of the arm, of the feet and legs, of the forehead, and those under the tongue. It is doubtful whether he practised *arteriotomy*, or was acquainted with the use of leeches for drawing blood. The purposes for which he had recourse to blood-letting are various, and not undeserving of notice even in the present day. He employed it, in the first place, simply as an *evacuant*, in order to get rid of redundant matters in the system; secondly, for the purpose of changing the determination of the blood to or from particular parts, as circumstances might seem to require. You may here observe the germ of the doctrines of *derivation* and *revulsion*—points of theory that were so much dwelt on at a later period, and which have scarcely yet lost their influence on practice. A third purpose for which Hippocrates had recourse to blood-letting was that of restoring a free movement of the blood and animal spirits in cases where they were supposed to be stagnant or obstructed, as in *apoplexy* and *palsy*. Fourthly, he used this evacuation to *cool* the body when morbidly or preternaturally heated.

Such were the views with which blood-letting was employed by Hippocrates; and, accordingly, he had recourse to it in a great number of diseases where it was supposed to be needed to fulfil one or other of the indications mentioned. In particular he recommends it in violent and acute diseases, especially *inflammations*, but only where the patient is strong and at the middle periods of life, for he thought blood-letting not adapted to either infancy or old age: he forbad it also to pregnant women, as being likely to cause abortion. He especially mentions inflammation of the different viscera—the liver, spleen, and lungs, as calling for this remedy. The boldness of his practice on these occasions deserves notice. In pleurisies, for example, he allowed the blood to flow till the patient fell into complete syncope, especially if the pain were very acute. When, however, the blood, while flowing, underwent a change of colour, as from a red to a dark hue, or the reverse, he considered it right to stop. In quinsies, and other disorders of an acute form, Hippocrates bled in both arms at once. Difficulty of breathing is another case in which this remedy was resorted to by Hippocrates; and he mentions one species of inflammation of the lungs, which he calls tumefaction from heat, in which blood is directed to be taken from various parts of the body at the same time, instancing, in particular, the arm, under the tongue, and the nostrils, as parts proper for the purpose. In cases of severe pain, he advises a vein to be opened as near as possible to the part affected. Thus, in pleurisy, the blood was taken from the internal vein of the arm of the affected side: but in milder cases he preferred taking it remotely, for the purpose of soliciting a flow of blood to a distant part of the body. He bled for the relief of pain simply as unconnected with inflammation. For the cure of diseases situated above the diaphragm he took the blood from the veins of the arm or upper part of the body; in those below the diaphragm, the blood was taken from the inferior parts, as the feet.

In fevers, even of the most ardent kind, Hippocrates did not draw blood, unless the fever were accompanied with some topical inflammation; thus making a distinction between primary fevers (that is, where the fever itself is the disease—the idiopathic,) and those which accompany or follow inflammation (symptomatic fever). It was in the latter only that he thought blood-letting advisable. In general, in acute cases, the patient was bled only once, but then to a large amount, even to fainting, as stated above, if the violence of the symptoms seemed to require it. In chronic inflammations, small and repeated bleedings were preferred; and instances are adduced of the good effects of this practice. He also advises it for the cure of dropsies under particular circumstances. It is remarkable that Hippocrates no where indicates the quantity of blood to be drawn in any particular case.

From what has been now stated, as well as from the general tenor of the writings of this most distinguished physician (a man who has had no equal in our art), you may perceive, and probably not without surprise, considering the disadvantages under which he practised at that early period, when medicine was little more than a science of observation, unaided, for the most part, by the lights of anatomy, physiology, or the other auxiliary sciences, how little reason we have to boast of modern acquirements, and how little, in fact, has been added to the stock of real practical knowledge since his time.

Erasistratus (who lived a century or more after Hippocrates, and who is distinguished as being the first, according to Galen, who ventured to dissect the human body,) prohibited both blood-letting and purging for the cure of diseases; at least he nowhere recommends their use. In hemorrhages, instead of drawing blood as his contemporaries did, Erasistratus substituted low diet and ligatures on the extremities, with the view, probably, of restraining the movement of the blood. The reason assigned by his followers for abstaining from blood-letting in general is not of much weight; namely, that as, in the treatment of fevers and inflammations, abstinence is indispensible, it would weaken the patient too much to use blood-letting at the same time. Other frivolous objections to the practice of bleeding were made, such as that it is not always easy to discover the vein proper to be opened, and that there is even danger of opening an artery instead of a vein; that many persons fall into a state of syncope either before or after the operation; and that some have actually died of fright under it; that we cannot always tell the precise quantity of blood required to be taken away in any particular case in order to subdue the disease; and that if less than this be taken it does no good, and if more, that we run the risk of killing the patient. Others said that the escape of the blood from the veins might be followed by that of the animal spirits, which, on such occasions, were supposed to pass from the arteries into the veins.

Asclepiades, a Greek physician of high repute, who settled at Rome a hundered years before the birth of Christ, followed pretty closely the steps of Erasistratus, except in regard to blood-letting, which he employed to a considerable extent. Asclepiades pursued, on the whole, a more active practice than that of his predecessors, which, on account of its inertness, he called "a meditation upon death." His reasons for abstracting blood, however, were of the most fanciful description, founded on the Epicurean doctrines, which represent all the phenomena of living bodies as depending on the motion of corpuscular atoms through corresponding pores, and disease as consisting in a want of correspondence between those corpuscles and pores. Asclepiades used blood-letting in inflammation provided pain were present, but not otherwise: thus, he bled the patient in pleurisy, but not in peripneumony or inflammation of the lungs themselves, because, in the latter, the patient does not suffer pain. He neither bled in fevers nor in phrenzies. The activity of his treatment in general, however, is shown in his treatment of quinsy, in which he employed at the same time, venesection in the arm, under the tongue, and on the temples. He also used scarification with cupping, with the view of *opening the pores.* If these means did not suffice, he incised the tonsils, and even recommends laryngotomy in extreme cases. All this, you will perceive, does not seem very consistent with the favourite and avowed maxim of this writer, that of curing *citò, tutò, et jucundè !*

Aretæus was very friendly to blood-letting, but he preferred, in general, small and repeated bleedings to large ones, which he considered to be dangerous. One motive assigned by him for the use of blood-letting was to produce relaxation of the solids; as for facilitating the passage of calculi through the urinary passages. This, you perceive, is in conformity with modern practice. Aretæus was amongst the earliest that practised arteriotomy. Speaking of this author, Haller says, "arterias incidit, ante Galenum, in temporibus et ad aures; alibique."

The Methodic Sect, of which Themison was the founder, used blood-letting frequently, and in the same diseases as Hippocrates did, but not with the same views. Instead of bleeding, in order to cool the body, they employed it to produce relaxation, all diseases consisting, according to their tenets, either in too great rigidity, or its opposite, relaxation. They seldom bled the patient more than once, unless by scarification and cupping, which they carried to a great extent, and successively, over almost the whole body. This sect, the Methodic, comprised many individuals of great reputation.

Celsus, equally remarkable for the elegance of his style, and his intimate acquaintance with the whole art of medicine as it existed in his time, was a great friend to blood-letting, and appears to have possessed an extensive and critical knowledge of the subject. He advises it in many cases in which his predecessors had forbidden its use, as in infants and in old persons, and also during pregnancy, observing on those occasions, that it is a matter of little importance to inquire what the age of the patient is, or whether pregnant or not, but what is the strength in each case. A vigorous infant, a robust old person, and a strong pregnant woman, bear this evacuation, he says, without either danger or inconvenience. Favourable, however, as Celsus was, in general, to the employment of this invaluable means of cure, he complains of the almost indiscriminate use that was made of it in his time. His rules with regard to blood-letting are, indeed, in most respects, conformable with the best views of modern experience. The strength of the patient is to be looked to, he observes, more than the other circumstances of the case; and this is better judged of by the quantity and quality of the blood, than by the aspect of the patient. It may, however, happen, he adds, that the disease calls for this evacuation while the body is not able to bear it. Still, if no other means offer themselves for saving life, he does not hesitate to recommend a trial of it; for, "satius est anceps auxilium experiri, quam nullum." In short, Celsus appears to have employed blood-letting in nearly the same cases in which it is resorted to at present, especially in violent fevers, where the face is much flushed and the veins distended. In pleurisy, he used it only when the disease was recent, and the pain acute. In peripneumony, he only had recourse to it when the patient was strong; if otherwise, dry cupping was employed. Apoplexies, palsies, convulsions, difficulty of breathing, internal contusions (indicated by spitting or vomiting of blood), and violent pain, are all of them cases requiring, in the opinion of this justly esteemed writer, the loss of blood. A rather curious observation is made in regard to apoplexy, namely, that bleeding sometimes appears to save—at other times, to kill the patient. This seeming anomaly I shall have occasion to explain to you hereafter.

With respect to time, Celsus did not bleed (except in urgent cases) earlier than the second day of the disease, on account, as he observes, of the crudity of the humours that are not yet ripe for evacuation; and he objected, likewise, to taking away blood later than the fourth day, for the reason that, by this time, the bad humours would be dissipated spontaneously, or, at least, have made their full impression on the system, in which case the only effect of bleeding would be, that of needlessly weakening the patient. By the by, do you not observe here, gentlemen, as on other occasions, the baneful influence of hypothesis on practice? through which the advantages of experience itself are often sacrificed; for certainly experience does by no means sanction the limitations here suggested. Celsus makes an observation confirmatory of that of Hippocrates, which I before noticed—namely, that when the blood, as it flows from the veins, begins to assume a bright vermilion hue, the further evacuation ought to be put a stop to; as being then rather hurtful than beneficial. Celsus was no friend, in general, to large blood-letting, so as to induce syncope; but he advises rather, that if a large quantity is required to be drawn, as necessary to the cure, that it should be taken at different intervals. This justly celebrated writer makes no mention of leeches, though they were in use long before his time, Themison having employed them. Celsus's independence as a writer is manifested in the ridicule he casts on the critical days of Hippocrates, the establishment of which he ascribes to the influence of the mysterious numbers of the Pythagoreans.

We find little that is original, or particularly deserving notice, on the subject of blood-letting, in the writings of physicians between the period when Celsus lived—that is, at the commencement of the Christian æra—and the time of Galen, who flourished in the second century afterwards. Galen attached himself chiefly to Hippocrates as his guide, whose system he laboured to re-establish and bring to perfection, in opposition to the prevailing sects of the time. With the exception of Hippocrates, no individual, perhaps, ever enjoyed so high a degree of celebrity, both living and posthumous, as the subject of our present remarks; and, for the most part, his fame was well deserved; for his knowledge of philosophy in general, as well as of medicine, was of the most extensive kind. Galen's vanity, however, was at least equal to his merits. He decries, in the most opprobrious terms, all who differed from him, either in opinion or in practice. The manner in which he expresses himself in regard to Hippocrates, sufficiently shows his excessive self-esteem, "No one, before myself," he says, "has pointed out the true method of treating diseases. Hippocrates, indeed, indicated the road; but as he was the first to discover it, it is not likely that he would be able to proceed so far as was desirable in it;" and he goes on to compare his own works in medicine with the great social and political improvements effected by the Roman emperor, Trajan; leaving his readers to draw the conclusion, that as Trajan was the greatest and most beneficent of emperors, so he (Galen) was the first and greatest among physicians. In another place he thus addresses his pupils:—"I never cared about the reputation I might gain in the world; truth and knowledge have been the only objects of my ambition. On this account, I never put my name at the head of my writings, and you know I forbad your lavishing extravagant encomiums on me, as you were wont to do."

Our present concern, however, with this distinguished physician, is in reference to blood-letting, which he employed to a considerable extent. In this point, indeed, as in most others, he followed the steps of Hippocrates, drawing blood with similar views—viz. to diminish plenitude (plethora), and to make a diversion (revulsion) of the humours; but he used the remedy with more freedom than his great predecessor. Galen appears to be the first that mentioned the absolute quantity of blood necessary to be taken on different occasions: neither Hippocrates, Celsus, nor any preceding writer, taking any notice of this. In ordinary cases, the largest quantity mentioned by Galen did not exceed a pound and a half; the smallest, seven or eight ounces. He held, that on certain occasions, blood might be properly taken till the patient fainted; and he mentions, as an extraordinary circumstance, that he had drawn from the same individual fifty-four ounces in the space of a single day. This was done at the commencement of an acute fever, where the patient was of a plethoric habit, and the blood in a state of great commotion. He limits this mode of practice, however, to the cases just mentioned; and as a caution against the general use of it in this way, he observes, that he saw two persons die in consequence of its adoption. As a safer practice, he advises that the patient should be bled to a smaller amount twice in the same day, or on successive days. Galen always bled the patient at the time of the day when the fever was at the lowest ebb, and, like Hippocrates, he took the blood from the side affected. He did not hesitate to bleed old persons when of a robust habit, but he never bled children under 14 years of age.

The physicians, many of them of high reputation, who lived in the two succeeding centuries, up to the period when the schools of physic and philosophy were transferred to Arabia, were for the most part compilers merely from the writings of Hippocrates and Galen. We are indebted to the Arabians, however, for the introduction of a number of articles into the materia medica, that were not before known or in use. We also owe to them the first description of several new and important diseases, that appear to have been totally unknown to the Greek and Roman physicians, such as the small-pox, measles, and other eruptive fevers, as we term them—diseases possessing strikingly peculiar or specific properties, and of totally unknown origin.

The Arabian physicians, of whom Avicenna was the chief, copied the Greeks in all essential respects, both as regards theory and practice. They were accustomed, however, to attach importance to some minor points, which are at present considered as of no moment. Thus, in cases of pleurisy, they said that the blood ought to be drawn from the side opposite to the disease, contrary to the injunction of Hippocrates, who directed that, for the relief of pain in general, the blood should be taken from the vein the nearest to the part affected. This difference of opinion, trifling and unimportant as we now consider it, was the cause of great and lasting dissension in the schools of physic, and entire volumes were written and published on the different sides of the question. To such a height, indeed, was the dispute carried, that the University of Salamanca, in the fifteenth century, took part with the Arabians, and made a decree that no one should dare to let blood from the side affected; and, to add authority to their decree, they endeavoured to procure an edict from the emperor, Charles the Fifth, to confirm it, alleging that the contrary practice was as prejudicial to the community as Luther's heresy itself; nor was the controversy terminated till the discovery of the circulation of the blood, by our distinguished countryman, Harvey, put at once an end to the dispute.

The Egyptians, as we learn from Prosper Alpinus,* used blood-letting in all its varieties, and to a great extent. They opened the veins of the temples, forehead, ears, corner of the eyes, nostrils, and throat, as well as others. Arteriotomy appears to have been nearly as much in use among them as venesection, especially in diseases of a chronic character. They opened the arteries about the temples, ears, and hands, with great freedom; nor had they any dread of the consequences usually apprehended from the operation. Prosper Alpinus says he had frequently witnessed the practice of arteriotomy while he was in Egypt, and observed the puncture to heal as readily almost as after venesection. They used certain precautions, however, in the employment of arteriotomy, both for insuring the success of the operation, and preventing inconvenience afterwards. By the application of a ligature at the proper part, the artery became much distended; it was then opened with the sharpest instrument, and by the smallest puncture possible, on account of the difficulty experienced in healing any large wound of an artery. When as much blood had been discharged as was thought requisite, some lint was placed on the wound, and a small piece of coin was strongly bound over it; and this was left on the part for three days, when the wound was found to be healed. The ancients seldom had recourse to arteriotomy, from an apprehension that life might be endangered by it, either from the artery not healing afterwards, or from gangrene taking place, owing to the great pressure required to stop the flow of blood. Galen†, on account of the mischief he had observed to follow in cases where the artery was accidentally opened in venesection, was not very favourable to the use of arteriotomy, unless for special purposes. He relates an instance, however, in which he opened the artery between the thumb and fore finger, in order to procure sleep; and he adds, that he witnessed the cure of a pain in the side, by opening the artery of the arm, and without aneurism following.

Scarification was so common among the Egyptians, Prosper says, that out of a hundred children you might meet in the street, you would scarcely find forty whose ears were not covered with cotton, on account of the scarifications they had undergone.

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* De Medicina Ægyptiorum.

† Lib. de Curatione per sanguinis missionem.

Leeches do not appear to have been in use in Egypt; perhaps from these animals, as is suggested, not being found in that country.

Paracelsus, the prince and prototype of quacks, though far more learned and illustrious than the modern race to whom we are accustomed to apply this designation, has the merit of introducing into practice several active preparations from the mineral kingdom. Paracelsus appears to have employed blood-letting, as well as other means of cure, though the particular views with which he used it are not stated.

If, now, you inquire into the fate of blood-letting in modern times (including under this denomination the long interval between the revival of learning in the fifteenth century and the present times), you will find that with few, and those trifling exceptions, the advantages of blood-letting have been highly, if not duly, estimated. In all ages indeed, not excluding the present, a few individuals have been found to decry the practice altogether, as fraught with evil consequences; some have even spoken of it as if it were unjustifiable on Scriptural grounds, arguing that "the blood is the life," and we are forbidden, in Scripture, "to take away life." An argument of this sort is not likely, I presume, to meet with many supporters in the present day. The opposition to the practice has been chiefly founded, I believe, in an affectation of singularity, for the sake of vulgar notoriety: it is certainly not sanctioned by experience.

It would occupy too much of your time, were I to pursue further the history of this all-important subject. I shall conclude, for the present, with observing, that at all times, and amidst the prevalence of every variety of medical doctrine, the merits of blood-letting have been fully recognised by the most observant, as well as the most experienced, physicians. Seeing then, the almost universal use that has been made of this remedy for the treatment of disease, from the earliest periods to the present time, and that it has been made the subject of innumerable writings, you will perhaps wonder that it should be thought requisite to discuss the subject further in the present day. When, however, you are told, that many and important differences of opinion still subsist with regard to it, amongst those even who are the most favourably inclined towards it, as to its mode of operation—the circumstances that influence its use—the extent to which it ought to be carried at different times and under different circumstances—as well as various other important points—you will admit, with me, that there is still room for further investigation of the subject. This I purpose to enter upon in the ensuing lecture.

# LECTURE III.

## GENERAL EFFECTS OF BLOOD-LETTING IN HEALTH.

Having, at our last meeting, given you a concise, but, I trust, a sufficiently extended history of *blood-letting*, as a branch of the healing art, I shall proceed to describe its effects generally on the system; by attention to which, we shall be better enabled to understand its operation in the removal of disease, or at all events to employ it with greater safety.

When blood, then, is drawn from any large vessel, either vein or artery, to a certain amount, and with a certain degree of velocity, (for this you will find to be a point of no small importance to be attended to,) the loss is followed by a number of changes in the system, which vary according to the quantity of blood lost, the rapidity with which it is taken, and the particular state of the individual at the time, in regard to strength, age, and other circumstances. These changes may be divided into the primary or immediate, and the secondary or more remote. This distinction is necessary in a practical point of view, as we are sometimes desirous of obtaining the primary, sometimes the secondary or more remote effects of the evacuation.

In adults of ordinary bulk, and at the middle periods of life, (excluding from consideration, for the present, both infancy and extreme old age, which will be noticed hereafter,) the abstraction of six or eight ounces of blood from a vein, slowly and quietly, as in ordinary venesection, produces, commonly, no striking or obvious effect; nor, generally speaking, any that is perceptible afterwards: neither the feelings, nor any of the other functions, are sensibly disturbed or impaired by it. But if the evacuation be carried to a greater extent; as, suppose, from twelve to sixteen or twenty ounces (the quantity varying, however, in different individuals); or, if the smaller quantity indicated above, be taken away rapidly; then great and important changes generally ensue, and which take place in a somewhat regular order, as perceptible in the state of the different functions, both of body and mind.

There is commonly first experienced a slight feeling of languor; and if the pulse at the wrist be examined, it will be found to beat more feebly, and often more slowly, than before, though sometimes the reverse of this takes place. Breathing also becomes slower, in conformity with the pulse, and it is often irregular, with deep sighs. If the flow of blood goes on, the languor increases; the pulse becomes still more feeble, and sometimes fluttering. To these succeed paleness and coldness of the skin, and shrinking of the features; cold drops of sweat hang on the forehead, and sometimes perspiration breaks out over the whole surface; the eyes look glassy, and the pupils are dilated. Occasionally, also, there is vomiting, with other involuntary discharges; and, in a few instances, epilepsy, or convulsive movements, more or less general, take place. The pulse, at last, is not to be felt; respiration ceases, and consciousness is wholly lost. This is the state termed *syncope or fainting;* during which, if complete, there is, in appearance, an entire suspension of all vital movements, morbid as well as healthy;—it is, in fact, a state of apparent death.

The effects now described are, for the most part, temporary in duration, and continue but for a short space of time: it may be for a few minutes only, rarely for half an hour; when the pulse again begins to be felt at the wrist; respiration is renewed, often with yawning; and consciousness returns. Hysterical laughing or crying occasionally takes place, as the patient recovers from the fainting state. The recovery from this state is hastened by a sudden application of cold to the skin; and by placing the body in the horizontal posture. This latter, indeed, is a powerful means of preventing the occurrence of syncope altogether.

In some instances, headache of a throbbing kind takes place soon after bleeding, and which may continue for several hours; and, sometimes, the following night is passed without sleep: both circumstances showing that not only the vascular action of the brain, but its functions also, have been disturbed by the evacuation. These effects, however, are not constant, nor even frequent.

When the primary and temporary effects resulting from the evacuation, as described above, have gone off, there often remain permanent changes, which depend upon the absolute quantity of blood lost, rather than upon the rapidity with which it is taken. If the quantity taken away should have been considerable, as a pound or more, there is not only a feeling of languor induced by it, but actual weakness; which is equally observed in the vascular and muscular systems: in the former, indicated by smallness and feebleness of the pulse—in the latter, by an inability to make the usual voluntary exertions.

When the loss of blood has been very large, as in cases of violent hemorrhage, whether spontaneous or accidental; or where blood has been largely and repeatedly drawn, (as is often requisite for the relief of some violent and dangerous disease,) the weakness induced by it is in proportion to the quantity of blood lost, and is often very durable. The skin remains pale, and bloodless in appearance, for many months: there is great languor, or feeling of weakness; and an imperfect, and sometimes an irregular, performance of all or most of the functions.

The effects of blood-letting, now described, are by no means always in strict accordance with either the quantity of blood lost, or the rapidity with which it is discharged from the vessels; but are modified by a number of different circumstances; such as the bulk, and strength, and age of the individual; peculiarity of constitution; season, climate, and mode of life;—all these influence, more or less, the effects of this agent: and it is necessary you should make yourself acquainted with them, when about to apply it for the cure of diseases.

That some attention is due to the size or bulk of the individual from whom blood is about to be drawn, seems too obvious to require mentioning. The strong, also, you will readily conceive, bear bleeding better than the weak. This, no doubt, is true in a general sense; but I may add, that although strength of system is always an encouragement to bleeding, where the circumstances of the case are such as to require this evacuation, weakness, even when considerable, is not of itself, or necessarily, prohibitive of it. The nature of a disease is not changed by the patient being in a state of weakness at the time; though such a state renders more caution necessary in the use of this, as of all other active remedies.

As to age, there is hardly any that absolutely, and in all cases, precludes the use of blood-letting; for no age is exempt from the diseases and injuries which in (their very nature, it might be almost said) call for the use of this remedy. You must not, for instance, adopt the notion, so commonly entertained, that infancy is a state of weakness that does not allow of the use of blood-letting. Strength and weakness in living beings have been looked at in too narrow a point of view, and measured chiefly by muscular power. Thus, it is said that a man is strong and a child weak; and that a horse is stronger than a man, and so on: strength, however, in living beings, is to be measured by the more or less perfect performance of the different functions of life in the aggregate. In this sense, strength is synonymous with perfect health. Physiologically, and also medically speaking, the strength of infants not only equals, but exceeds, that of adults. Vitality is greater in early life than at the later periods; all the actions of life, whether healthy or morbid, are then performed with greater energy. In infants, for example, inflammation is both more frequent and more active than in adults; and it runs its course more rapidly, through its different stages, to disorganization and death. Greater promptitude and activity of treatment are, therefore, necessary in the applicationof remedies in early life; and of blood-letting amongst the rest, when called for by the circumstances of the case.

The diseases of old age, likewise, are not unfrequently so active and inflammatory in their nature, as to call for loss of blood, as indispensable to the safety of the patient. The progress of disease, however, especially of inflammation, is commonly less rapid in advanced life; so as to afford more time and opportunity for the employment of remedial measures, or (which is scarcely of less importance) for the spontaneous subsidence of the disease—a mode of termination which, though exceedingly frequent in a great number of diseases, is by far too little regarded in general practice.

But both in infancy and old age much caution is necessary, in regard to the quantity of blood that is to be taken away. Under certain circumstances, infants may be bled with safety and advantage, even a few days after birth; as I know by repeated trial.

But in such cases, a drachm or two of blood are to be regarded as equivalent to many ounces in the adult; so in old age, again, where bleeding is often called for, attention to quantity is required. The safe limits here may be taken, perhaps, as extending from four to six or eight ounces; and such quantities produce, in general, a very perceptible, as well as beneficial effect.

Peculiarities of constitution, or idiosyncrasies, as they are called, are met with occasionally, in regard to this, as well as other remedies. The strongest and most courageous man will sometimes become faint, from the loss of a few ounces of blood; while a weak and timid female may bear to lose a much larger quantity, without any sensible effect. Such peculiarites of constitution, however, do not seem, according to my observation, to influence materially the medicinal application of the remedy; so as to render it less necessary in the one case, or more so in the other, and they may disappear in the course of the disease; so that persons will often faint on the first bleeding, at the out-set of the disease, even from the loss of a few ounces of blood, while they bear a repetition of it afterwards, and that for many times, without any such effect—a proof that blood-letting does not effect its purpose, as a remedial agent, simply by weakening the system.

Season and climate are, likewise, circumstances that have an influence on the use of this remedy. In winter, and in spring, diseases are said to be of a more active and inflammatory character, so as to bear blood-letting better than when they occur in summer and autumn. But the difference here, I conceive, is one of degree chiefly. In summer and autumn, the body becomes irritable from over-excitement, but is not rendered strong in proportion; nor can abstraction of blood, to the same amount, be so well borne as in the colder seasons of the year. Inflammation, however, is not less prevalent in the former than in the latter, though it commonly affects different organs; nor does it less require blood-letting for its relief, but not to an equal extent. The same observation applies to climate.

Luxurious living begets a tendency to inflammatory diseases. Hence the inhabitants of large towns require blood-letting more frequently than those residing in the country. The contrary of this, I know, has often been asserted; but, I think, without foundation. The Italian physician, Ramazzini, remarks, in his work "*De Morbis Artificum*," that countrymen, accustomed to hard labour and harder fare, bear loss of blood worse than the inhabitants of cities, who live luxuriously.

Such are the effects of loss of blood on the system generally. But it may be worth while to notice somewhat more particularly the way in which it appears to influence the functions individually; for there is here a considerable difference to be observed.

The first, and most immediate effect of blood-letting, is that which it exerts on the sanguiferous system, the heart and blood-vessels; the condition and action of which, it is capable of controlling more effectually and permanently, perhaps, than most other medicinal agents. This is, in fact, its most important application, and the most deserving your attention; for the most violent and fatal diseases,—those, too, of the most frequent occurrence, are seated essentially in this class of organs; in proof of which, it is sufficient to mention fevers and inflammations of all kinds, in which the action of the heart and arteries, and in consequence the circulation of the blood, are always more or less disturbed. Blood-letting, accordingly, from its power of influencing the state of these, is one of the remedies the most frequently called for in practice, and which, when judiciously administered, is also one of the most effectual for the purpose. The effects of blood-letting on the sanguiferous system, therefore, are to be especially studied.

Loss of blood does not affect equally or uniformly the different parts of the sanguiferous system; whether we consider it in the light of a *depletory* measure (to use an Americanism), or as influencing the living actions, a striking difference, in this respect, will be observed. Thus, with respect to the heart, the action of this organ is sometimes rendered less, sometimes more frequent, and often irregular also, from loss of blood, according to the quantity lost, the rapidity with which it is taken, the state of the individual at the time in regard to general strength, and also according to the particular irritability of the heart itself. The effect, again, is influenced by disease, whether of the heart primarily, or of other parts of the system. These differences in regard to the action of the heart are generally indicated by corresponding states of the pulse at the wrist; but occasionally it is observed that the pulse is regular where the action of the heart is quite otherwise—thus proving the great share the blood-vessels have in effecting the movement of the blood.

So, again, with regard to the blood-vessels, the condition of which, in regard to strength and fulness, we commonly judge of by the pulse. A large abstraction of blood has very generally the effect of diminishing the strength and fulness of the pulse. On certain occasions, however, it has the contrary effect, the pulse rising, as it is termed, or becoming fuller and stronger than before. In order to understand this, you must recollect that the blood-vessels are not mere elastic tubes, but irritable muscular structures: and, like other muscles, under the influence of the nervous power, by which their irritability and contractility are determined. This contractility varies naturally in different parts of the system. It is greater, *cæteris paribus*, in the arteries than in the veins, though evidently possessed by both. It is greater in the smaller than in the larger vessels; and greatest of all in the capillaries.

It results from this difference in the irritability and contractility of different parts of the sanguiferous system, that disturbing causes of any kind produce different effects on different parts of this system. Certain emotions of mind, for example, will occasion the heart to throb violently and irregularly, without any perceptible change in the pulsation of the artery at the wrist. A feeling of dread, or the sight of a disgusting object, will often occasion a sudden contraction of the capillaries, so that the blood will desert the surface, and the pulse become nearly imperceptible. The sudden application of cold to the skin, however partial, will have the same general effect. The contractility of the heart and blood-vessels is also materially influenced by disease of different kinds, as will be shown hereafter. In short, by no management can blood be so drawn as to diminish equally the fulness or tension of the whole vascular system.

The different secretions, in a healthy state of the body, are commonly diminished by loss of blood. When, however, they are suppressed from active disease, as in recent catarrh and other inflammations of the mucous membrane, blood-letting, by taking off or reducing the inflammation, occasions a return of the secretion, and that often in a degree beyond the natural.

Respiration, in ordinary cases of loss of blood, is only affected in conformity with the action of the heart. If this become slower, the breathing undergoes a corresponding change; but if the evacuation be carried so far as to induce syncope, or even an approach to it, respiration becomes very irregular, till at length it ceases altogether.

The effect of blood-letting on the organs of nutrition is not a little curious. If the blood be so taken as not to disturb sensibly or materially any of the more important functions of the body, the appetite for food is often observed to be increased, with an equal improvement in the processes of digestion and assimilation : so that the body is better nourished afterwards, and the loss it has sustained is speedily compensated. Small and repeated abstractions of blood, in this way, appear to have the further effect of inducing a subdued and calmer state of the general circulation; in consequence of which there is less waste taking place by secretion and exhalation. This state of the circulation seems to be favourable to the deposition of fat in the cellular interstices of the body, and greater corpulency is often the result. The same is observed in other animals, a circumstance that is taken advantage of by butchers, in preparing calves for slaughter.

We may learn from this, by the by, that blood-letting and abstinence, though generally combined in practice, are by no means identical, or even similar, in their manner of influencing the system; so as to admit of their being at all times fit substitutes for one another. Abundant experience has convinced me, that blood-letting may be usefully resorted to, in a number of cases where abstinence is not at all required: and where, indeed, it would be rather hurtful, than beneficial.

I believe it may be safely laid down, as a general rule, with exceedingly few exceptions, that wherever there is a decided inclination for food of a simple and ordinary description, whether animal or vegetable, the appetite may be safely indulged; not merely without injury, but even with advantage. The effect of thus moderately exciting the stomach is, to equalize the circulation, a point of no small importance in diseases in general; a disproportionate determination of blood almost always taking place towards the diseased organ, whatever this may be.

Absorption from the cavities and interstices of the body would seem rather to be increased than diminished by loss of blood, provided the evacuation be so moderate as not to produce material disorder of functions. This seems analogous to the increased absorption by the lacteals, just mentioned, and answering the same purpose in the animal economy, namely, the supplying the system with what it has lost. The relief derived from blood-letting in some cases of dropsy has been ascribed to increased absorption. But the effect may, I think, with greater reason be referred to diminished secretion or exhalation. It may be doubted whether blood-letting can ever be usefully employed for the simple purpose of producing absorption, in dropsy; although its advantages, on numerous occasions, as a remedy for this disease, (or, to speak more correctly, for removing its cause,) is not to be questioned. But more of this hereafter.

The effect of blood-letting on the nervous system, or rather on the cranial portion of it, the brain, and its functions (for we are but little acquainted with its influence on the other parts of the nervous system), is peculiar, and worthy of notice. Sensibility to all kinds of impressions, internal as well as external, appears to be heightened rather than diminished, by loss of blood: persons become more sensitive, or nervous, as the expression is. And with regard to the voluntary power, mobility, or the disposition to act in the muscles, both voluntarily and involuntarily, appears to be increased, while the power of acting with effect, and continuously, is diminished. Hence the tremulous, but, at the same time, feeble movements, that are performed in such circumstances.

The mental power, as far as one can judge, is not sensibly impaired, nor disordered, by even a considerable loss of blood; provided this take place so slowly and quietly as not materially to disturb the general system. It is observed, accordingly, that in persons dying of hemorrhage, and in many other diseases in which the brain itself does not participate, the cerebral functions of sensation, volition, and thought, continue to be exercised to the last, and long indeed after the pulse ceases to be felt. The independence, to a certain degree, of the brain upon the heart, is thus strikingly shown.

In the administration of blood-letting for the relief of disease, it is highly necessary to attend to the state of the mind and feelings of the patient; for these may be such as to render it difficult to judge of its necessity, and, indeed, sufficient to countervail any advantage likely to be derived from it. In persons of a timid disposition, the bare proposal of the operation of bleeding, or even the apprehension or expectation of it, will sometimes occasion such general disorder in the system, and in the pulse more especially, as may lead us to form an erroneous opinion as to the existing malady, and its treatment. In such cases, time must be given for the subsidence of the emotion, before the measure is determined on. You must not, however, in cases of emergency, be deterred by trivial circumstances of this kind, from insisting on the point; for the life of the patient often hangs on your decision. A little delay, with persuasion, will often do much towards reconciling him to the measure proposed.

## LECTURE IV.

### OF THE MEDICINAL USE OF BLOOD-LETTING IN GENERAL; WITH THE THEORY OF ITS OPERATION.

I remarked at the outset, that blood-letting ranks among our most effective medicinal agents; and I may now add, that, like all others of great activity, it is powerful for good or for evil, according to the judgment and discrimination with which it is administered. It behoves us, therefore, to use it at all times with great caution and circumspection, lest, in our endeavour to do good, we unwittingly inflict a great, and perhaps irremediable injury on the patient. There is no doubt of this remedy having been sometimes resorted to without absolute necessity; that is, in cases that might have done well without it; but much more frequently, I believe, it has been withheld, where its use would have been followed by great and decisive benefit. Where it is employed, however, it is not always well timed, nor judiciously administered in respect to quantity, repetition, and manner of drawing; all of which, we shall find, are points of no small moment.

In considering blood-letting as a therapeutic agent, one cannot but be struck with the wide differences of opinion entertained by practitioners with regard to it. Few, in the present day, are so hardy as to deny altogether the usefulness of this remedy, nor even the absolute necessity for it on many occasions; for to do this would be to fly in the face of almost universal experience. Yet by those who are favourable to its employment it appears to be held in different degrees of estimation, even in the same disease, and under apparently similar circumstances. Now, considering that its utility is determinable in all cases by careful and sufficiently extended observation, one is surprised at the discrepancy of opinion that still subsists on the subject. This can only be accounted for, I apprehend, upon the supposition that physicians, in their use of this remedy, have been more guided by theory, or preconceived notions, in regard to the nature of disease and the presumed mode of acting of the remedy, than by real experience, or a careful observation of its effects under actual trial. If we knew intimately and perfectly the nature of disease, as compared with the healthy state, we should probably comprehend the way in which blood-letting, as well as other medicinal agents, effects its purpose; and, at the same time, be enabled to apply it with something approaching at least to certainty as to the result. Such, however, is not the state of our knowledge at present. We are under the necessity, therefore, of placing our chief reliance on observation and experience, as the only guides that can be safely and implicitly followed.

Blood-letting may be considered in three points of view—as curative, as palliative, and as preventive; and in all these respects it is important.

In regard to its curative powers, blood-letting is capable of removing, with more or less facility, though never, perhaps, with absolute certainty, a great number of diseases which, but for its aid, would endanger or destroy life, and which cannot be effectually combated by other means. Considered in the light of a palliative merely, it is still of no small value. There are a great many diseases that are, from the first, and in their nature, as it were, incurable by art; others, that become so during their course. But there are scarcely any that do not admit of more or less of palliation; and blood-letting is often the best means we have of effecting this purpose. An instance of this is afforded in the case of phthisis pulmonalis, where the acute pain that occasionally arises in the chest, even in an advanced stage of the disease, and when the case is altogether hopeless, seldom fails to be relieved by a small bleeding; and (provided this be done under proper limitation) without any increase of weakness, or other inconvenience. On the contrary, not only is the pain relieved, but the hectic and night-sweats also; while the appetite is usually improved by it, and sleep rendered more refreshing. The same remedy is also, on many occasions, preventive in its effect; by lessening, if not destroying, the tendency to certain diseases, of which, apoplexy, hemorrhage, and inflammation, may be cited, as examples sufficiently well known.

Before, however, you have recourse, in any case, to blood-letting, as a means of cure, you ought to satisfy yourselves on the following points:—First, whether the remedy is adapted to the nature of the existing malady; and, secondly (supposing this to be the case), whether the circumstances are altogether such as to justify its employment.

As to the nature of the disease, I may observe that there are some diseases to which blood-letting is commonly considered peculiarly adapted; such, for instance, are apoplexy, hemorrhage from the lungs, and violent inflammation in general. Now from the predilection that exists in favour of blood-letting in those affections, you will feel, as it were, predisposed to resort to it, perhaps without sufficient consideration, and at the risk of carrying it to too great a length. But it is proper you should know, that even in these diseases, blood-letting is not always admissible; on the contrary, there are many instances in which this remedy may be safely dispensed with; and others, to which it would be wholly inapplicable, On the other hand, the use of blood-letting is as generally condemned in what are termed nervous disorders, dropsies, intermittents, and others; it being considered not only useless in such, but in opposition to the very nature of these affections. All this, however, is by far too general, and admits of numerous exceptions. In fact, general rules on this, as on all other subjects, are very apt to mislead. Blood-letting may be better adapted to some disease than to others—for example, to inflammation; but still, there is no form of disease which, at all times, and under all circumstances, admits of its employment. On the other hand, it may with equal truth be affirmed, that there are few which may not occasionally justify its use; so far, at least, as an auxiliary towards the cure. What these circumstances are, can only be fully and satisfactorily indicated when we come to treat of the application of the remedy to individual diseases.

Blood-letting is found useful in a great number of diseases that have little or no similarity, and such, indeed, as are generally considered to be of different natures, and to require different and even opposite modes of cure. Thus it will occasionally remove spasm, as well as inflammation. It is often anodyne, or a means of relieving pain. It sometimes acts as a narcotic, and is followed by tranquil sleep—at others, it occasions watchfulness. It is capable at times of removing obstructions, as they are termed, and thereby of restoring suppressed discharges; and, on the other hand, of restraining them when in excess. Nor is its use by any means confined to habits of strength or fulness; for it is not unfrequently needed by the weak as much as by the strong.

With regard to the other point I mentioned, namely, its fitness for adoption under the particular circumstances present, you should inquire whether the call for the remedy be so urgent that it cannot with safety, or even common prudence, be dispensed with; or whether there may not be found substitutes for it, that are equally safe, prompt, and effectual; for, in that case, they ought, no doubt, speaking generally, to be preferred. The reply to this, however, involves many considerations. Blood-letting, though well enough adapted to the existing disease, may nevertheless be not absolutely indispensable to the cure; for the disease may, perchance, subside without it, and yet its use may be attended with advantages that will more than compensate for any inconvenience to which it is liable. It may, for example, be more certain of attaining its object than other remedies, or it may be more prompt in its effect, so as to shorten the duration of the disease, thereby relieving the patient from protracted and unnecessary suffering. It may chance also (not a very improbable supposition) to be really milder in operation, and the cause of less suffering, both immediate and remote, than the other means usually resorted to as substitutes for it; such, especially, as violent and frequently-repeated purging, blistering, and the use of mercury, which are often so mercilessly inflicted on the patient.

Having thus decided on the propriety of drawing blood, you have next to determine the extent to which the evacuation is required, and in what mode it may be most advantageously effected, in the particular case before you; for these, you will find, are not matters of indifference. The remedy must be carried to a certain extent, in order to ensure its purpose. This purpose, again, is sometimes best answered by a single large bleeding; sometimes by a repetition of it to a smaller amount. Our object, for example, may be to produce a sudden and marked impression on the system at large, as the surest means of accomplishing the end we have in view. In order to effect this, it is requisite that the blood should be drawn freely and rapidly. At other times, the purpose may be as well or better answered by a more moderate and quiet use of the remedy; as where the disease is of considerable standing, in which case it is hardly possible to cure it quickly to whatever extent the remedy be carried.

Thus you perceive that there are various points requiring attention, and which must be treated of in turn. We will first, however, inquire into the probable mode of acting (the *ratio medendi*) of blood-letting, constituting the *theory* of the subject.

## *Theory of Blood-letting.*

The *ratio medendi*, or manner in which medicinal agents effect their purpose in the removal of disease, is an important branch of medical study. Had we a perfect knowledge of this, we should be able to administer remedies with greater precision, and, probably, with greater certainty as to the result, than is at present the case. We should, at the same time, be better judges of the ill consequences to be apprehended from an injudicious or mistaken employment of them, and thereby learn greater caution in their use—a thing particularly necessary at present, when the most active and virulent poisons are daily, and, I might add, almost indiscriminately, applied to the purposes of medicine. This kind of knowledge, however, is of very difficult attainment. Therapeutic reasoning in general is of the most vague and unsatisfactory nature; little that has been brought forward on the subject bearing a scrutiny, or making an approach even towards demonstration.

A variety of opinions have been promulgated at different periods, in regard to the supposed mode of acting of blood-letting; founded on the particular views that happened to be entertained at the time, of the intrinsic nature, or proximate cause, of disease. Many of those opinions are altogether hypothetical, and also inconsistent with the principles of the animal economy; and accordingly they have been successively abandoned, in proportion as the extension of physiological science has served to show their futility. Without dwelling on such, it will be enough to direct your attention for a short time to the existing doctrines, for the purpose of inquiring how far they merit our confidence.

When the circulation of the blood was first discovered, it was expected, and not without reason, that the mode of acting, as well as the effects, of blood-letting, would be clearly understood : but it turned out far otherwise ; insomuch that it is a matter of doubt whether the subject did not become involved in greater obscurity than before. The effects of blood-letting were judged of upon mechanical and hydraulic principles ; as if the blood were moving in inanimate, or, at least, in simply elastic tubes. The contractility of the vessels, a vital property, and nearly allied to muscularity, if not identical with it, was wholly overlooked, although, without reference to this, it is impossible to comprehend a variety of phenomena that present themselves in the movement and distribution of the blood.

The opinions most generally entertained at present, in regard to the mode of acting of blood-letting in the removal of disease, may be reduced to the following heads :—

1st. That it acts upon the principle of depletion simply, or in other words, by diminishing the general mass of blood.

2dly. By weakening the system altogether.

3dly. As a sedative, or by diminishing vascular action, this in a great number of diseases being in excess.

The first of these opinions, namely, that blood-letting operates upon the principle of depletion, is founded on the supposition that there is often a superabundance of blood in the system, constituting what is called plethora ; and that such plethora is a cause of various inconveniences, and even, at times, of immediate danger to life. It was thought, for instance, at one time, that such an overcharged state of the vessels would impede the general circulation, the heart being thereby rendered unable to move forward so unusual a load : and for this state of things, blood-letting naturally suggested itself as an appropriate remedy. Thus Boerhaave observes, in his *Institutes*,* that " blood-letting (within the limits of not reducing the general strength) diminishes the quantity of blood in the vessels—the *moles movenda*—and thereby indirectly increases the moving power in the function of circulation." This notion was not unreasonable, as long as the heart was imagined to be the sole propelling power in the function of circulation. The diminution of the general mass, would, on such a supposition, enable the heart to perform its office with greater ease. But when it came to be understood that the blood-vessels themselves contributed largely, by their action, to the movement of the blood, and that this action, as well as that of the heart, is liable to be diminished by any considerable loss of blood, it became clear, that the employment of blood-letting, for the mere purpose of promoting the general circulation, in the way here supposed, could not be supported.

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* Institutes of Medicine, No. 1228.

There is, nevertheless, one case in which blood-letting may be said to promote, though indirectly, the general circulation; and that is, where the brain is suffering oppression from the violent action of its own arteries. This condition of brain, as it occurs in intoxication, and in many apoplexies, renders the heart and blood-vessels torpid, as indicated by unusual slowness, and sometimes feebleness, of the pulse. In such cases blood-letting often promotes the general circulation, by diminishing the action of the cerebral arteries, and thus relieving the organ from the state of oppression alluded to. With this exception, blood-letting tends to lessen rather than to augment the force of circulation. The propelling power, in fact, is diminished in a higher ratio than the resistance to be overcome.

Another idea was, that a plethoric state of system might, by distension, act as a stimulus to the heart and arteries, so as to excite them to inordinate action, and thus give rise to disorders of a febrile and inflammatory character. It is a question, however, whether these disorders, when they do occur, are really produced in the manner here supposed. Changes in the distribution or determination of the blood, from one part of the system to another, and consequent distension of vessels, are frequently taking place, and that to a great extent (as from the application of cold to the surface), without any bad effect following. It is, no doubt, true that many disorders of a febrile and inflammatory nature are quickly and effectually subdued by taking away blood; but the quantity required for the purpose is often too small to produce any appreciable effect in lessening the fulness and tension of the vessels altogether. It is in some other way, probably, than by simple depletion, that the salutary effect is produced in such cases.

It has been thought again, that, on some occasions, the vessels are in so plethoric a state, as actually to burst from over-distension; and the occurrence of spontaneous hemorrhages was so explained. Upon this principle blood-letting would naturally enough be resorted to, as an appropriate means of cure. But admitting, as one must, that the remedy in question is found on many, though by no means on all, occasions, both to prevent and put a stop to hemorrhage, the effect is explicable on other grounds, as will be shown hereafter.

But the existence of plethora altogether admits of a question, and certainly is a thing not easy of proof. There are no means of estimating correctly the quantity of blood in the system, at any time; while the signs usually pointed out as proofs of existing plethora are, at best, equivocal. The plethoric state is supposed to be indicated chiefly by the following signs:—General fulness of habit; a florid hue of the skin; redness of the tunica conjunctiva of the eye, and of the inside of the nose, mouth, and lips; a distended state of the veins; an augmented temperature of the whole body; a sense of fulness or distension, especially in the head and chest; drowsiness, and disinclination for all exertion; and lastly, a strong, full, and slow pulse, with a disposition to occasional returns of hemorrhage.

Now there is hardly one of these that is not equivocal, and that may not be more satisfactorily accounted for. I hardly need observe to you, that fulness of habit, or corpulency (which consists in an unusual accumulation of fat in the different textures appropriated to its reception), is quite distinct from plethora, or superabundance of blood in the vessels. It is a common observation, that corpulent people generally take but little food; and you will recollect what I before stated, that frequent bleeding tends rather to induce than to diminish corpulency. It is a well known fact, also, that fat persons do not generally bear bleeding so well, nor to the same extent, as those of spare habits.

The florid countenance, the redness of the eyes, and other similar signs, indicate only an increase of arterial action, and consequent determination of blood to particular parts; while a full and strong pulse, and tumid veins, with augmented temperature, are merely the result of a general increase of action in the sanguiferous system. The sense of weight and fulness in the head—the drowsiness, and disinclination for exercise—and the slow pulse—which are so often met with in corpulent persons, may be attributed to pressure on the jugular veins, by which the return of blood from the head is impeded, and thereby a degree of stagnation in the circulation of the brain produced; thus giving rise to a lethargic, or slightly apoplectic state. The same mode of reasoning may be applied to the chest, where a large accumulation of fat cannot fail to embarrass the movements of the heart and lungs.

The causes assigned for the production of plethora—namely, luxurious living, without sufficient exercise, and too great indulgence in sleep, are far from satisfactory. They are causes, indeed, of obesity; but this, as already observed, does not necessarily imply a superabundance of blood in the system.

Another cause of plethora has been suggested,—namely, the removal of a considerable portion of the body, as by amputation of the larger limbs; it being thought, that in this case, the organs of nutrition would continue to form as much blood as before the body was so mutilated. This does not appear a very probable supposition, judging *à priori*. The actions of the stomach, and other organs that co-operate with it in supplying new materials to the body, are regulated principally by the wants of the system. Thus it is observed, that when blood is drawn to a moderate extent only, and so as not to disturb the general health, the desire for food is increased, and blood is the more rapidly formed, in order to supply the loss The case of menstruation in females serves to illustrate this; for just as much blood appears to be formed in the intervals, as had been lost by the previous menstrual discharge. And it may be further observed, with respect to amputation, that there is commonly more or less of general disorder following the operation, and which usually continues for many weeks; during which nutrition is imperfectly performed, as is evident from the emaciation that takes place in such cases; and in this interval, the organs would be likely to accommodate themselves to the new circumstances of the system.

From what has been now stated, the existence of plethora can hardly, I think, be considered as sufficiently proved. The quantity of blood in the system may be easily diminished; but it is not so clear that it is ever materially in excess. Blood-letting, no doubt, is very capable of relieving most of the symptoms ascribed to plethora; but it probably acts upon another principle than that of depletion simply, namely, by diminishing arterial action, from the excess of which such symptoms appear, for the most part, to proceed. The effects of over-stimulation have probably been mistaken for those of actual repletion. By taking food in too great quantity, or of too stimulant a kind, the stomach in the first instance, and, subsequently, the rest of the system, are preternaturally excited; and a tendency to, if not actual, disease is thus generated. But this, it is evident, may be the case, without the supposition of plethora. And, moreover, when you reflect upon the small quantity of blood that is commonly required to be removed, in order to relieve such symptoms, and compare this with the entire mass (of which, probably, it does not, in any case, constitute a thirtieth part), it is difficult to imagine the curative effect to depend simply upon the diminished fulness of vessels thus occasioned. If depletion simply were the cause of the benefit derived from blood-letting, the effect might be expected to correspond with the quantity of blood lost; whereas, experience shows, that in many cases as great and as beneficial an effect may be produced by the loss of a few ounces of blood, taken in a certain way, as by a much larger quantity differently drawn.

But even allowing plethora to exist, which, for the reasons stated, appears to be at least questionable, it is still, as was observed by Vanswieten, "never of itself a disease, but only gives a predisposition to it: it is not a disease till it is accompanied by some disorder of functions."* Upon the whole, then, you may, I think, discard the idea of general plethora, or over-fulness of vessels, as a foundation for the employment of blood-letting.

There is one modification of plethora that has of late been much insisted upon by pathologists, in which, not general, but partial, over-distension of vessels, is supposed to take place, and to which the name of local congestion has been applied. This term appears to me to have been used without much precision, and applied to cases to which it has no proper reference. Literally speaking, local congestion means an undue accumulation of blood in the vessels of some part of the body; and, in this sense, is as applicable to arteries as to veins. But, in general, the allusion has been to the latter only; and accordingly, you read a great deal about venous congestion, especially in the liver, lungs, or brain; which organs are said, by a barbarous construction of language, to be in a congested state; while the most formidable, and even fatal symptoms, have been referred to this supposed source.

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* *Commentaries*, i. 277. This excellent practical writer is by far too much neglected in the present day. I know no work that contains such a fund of valuable practical matter, (the result of actual experience,) or the study of which is so well calculated to check the prevailing fondness for speculation, as the one here quoted.

Thus, the stupor of apoplexy, the coma that attends certain states and stages of fever, oppressed breathing, and an impeded or disordered function of the liver, are frequently ascribed to venous congestion; and that with as much confidence, as if it were an established fact, and one that admitted of easy proof. But, in reality, there is no proof offered of the existence of such a state as venous congestion during life, that is at all satisfactory; nor, if proved, would it afford an adequate explanation of the symptoms ascribed to it. The subject is of some importance, whether theoretically or practically considered; and therefore I shall offer no apology for dwelling on it for a short time.

Venous congestion, as it is called, or a preternatural accumulation of blood in the veins, ought to be clearly proved, before it is used in argument, for the purpose of explaining the phenomena of disease; and more especially, before it is made a ground upon which to form our indications of cure. Now, in neither of the cases mentioned, apoplexy, coma, oppressed breathing, or liver disease, has the existence of such a state as venous congestion been satisfactorily established; nor, in fact, can it be so during life; and I need not tell you that the evidence derived from dissection is quite inapplicable to the point. It is true that the veins are often found gorged with blood after death; and that, perhaps, in a greater degree than ordinary in the particular cases mentioned. But the arteries are, at the same time, observed to be empty; the expulsion of their blood into the corresponding veins being, in them, the last act of life. The more active the arteries are while living, the more enlarged they gradually become, and the greater is the quantity of blood they carry; the more, consequently, they will have to discharge into the veins at the moment of death. A preternatural fulness of veins, as appearing on dissection, is to be regarded, therefore, merely as a proof of the greater activity of the arteries during life. So that venous congestion, as observed after death, in general only implies previous arterial fulness; as this, again, implies increased arterial action.

The existence of venous congestion has been inferred (but certainly not proved) from the imperfectly performed or interrupted function of the organ concerned. Thus, in the comatose state of fever, it has been thought that there was congestion of blood in the brain, especially in the veins and sinuses; and it has been advised, in consequence, to take blood from the jugular veins, as the readiest way of getting rid of the superabundance of blood supposed to be congested within the skull. But although it is undoubtedly advantageous, in some of these cases, to take blood from the jugulars, there are many others in which such a remedy would be injurious rather than beneficial; though, upon the principle of venous congestion, the practice alluded to should be applicable in all such cases.

Any mechanical obstruction to the return of blood by the veins, in their course towards the heart, might undoubtedly give rise to a distended state of these vessels, and which might be termed venous congestion. But this does not apply to the cases here alluded to. In ordinary apoplexy, and in the comatose state of fever, nothing of this kind is observed: there is no known impediment to the return of blood from the brain in such cases, unless it be that which is occasioned by the pressure of the distended cerebral arteries on the veins within the skull. Such pressure must of necessity produce more or less of stagnation in the circulation of the brain; and upon this stagnation, and not upon simple compression of the substance of the brain, as is commonly supposed, the impaired state or suspension of functions probably depends. It is no argument against what has been just stated, to say, that the principal arteries and veins within the cranium are remotely situated from each other; for the effect would be as readily produced through the medium of the incompressible cerebral substance, as if the arteries and veins were in immediate juxta-position.

Another way in which blood-letting has been supposed to operate in the removal of disease, is by inducing weakness; it being thought that, on some occasions, there is a preternatural degree of vigour of the whole system, constituting what was termed the sthenic diathesis, in opposition to the asthenic, or state of general debility. Upon this ground, diseases in general were arranged in two great classes, the sthenic and asthenic, and a mode of treatment inculcated in conformity with this distinction. Blood-letting, of course, presented itself as the principal debilitating power. All this, however, is entirely fanciful. There is no such thing as a general excess of strength, in living bodies. The strength may be diminished in various ways, as by abstinence, evacuations, and long-continued over-excitement of any kind; but there is no reason for supposing it to be ever in excess, or beyond the degree of perfect health, a state in which every function is duly and perfectly performed; so that health and strength may be considered as nearly synonymous terms.

Diseases, therefore, neither consist essentially in, nor are derived from, excess of vigour in the system at large. I do not deny that weakening the general system, whether it be effected by blood-letting or any other means, conduces at times, and under certain circumstances, to the removal of disease, and especially where the habit is strong; but the same remedy is often found equally effectual for its purpose, where the body is already weak. In both cases, the remedy is uncertain in its effect, and frequently fails to cure. This would seem to show, that it is not simply by inducing weakness that the object is attained, but in some less direct way—probably by lessening the disposition to disease.

Lastly, blood-letting has often been supposed to effect its purpose by a sedative operation, that is, by diminishing vascular action, without regard to the general strength. A great number of diseases in which this remedy is found useful are accompanied by much vascular excitement; febrile diseases in general. But such diseases do not consist simply in increased vascular action, nor do they yield, with any thing like certainty, to this or any other sedative remedies. Blood-letting is not required in all cases in which vascular action is in excess; on the contrary, equally good effects are often found to result from remedies of a totally different nature, as will be seen hereafter.

It must appear, then, I think, from what has been said above, that it is neither as an evacuant merely; nor by lessening tension; nor by weakening the system altogether; nor by a sedative operation on the vascular system, that blood-letting effects its purpose in the removal of disease. Let us next inquire whether a more plausible explanation of the matter can be given, and one that at the same time will serve us as a better guide through the intricate paths of practice; for unless this is to be the result of the inquiry, it would be a waste of time to pursue it further.

Now when we consider that the same agent (blood-letting) is found capable of relieving, at different times, a great variety of morbid states that differ widely from one another, not only in their general characters but in their intrinsic nature—that, in innumerable instances, it proves a sovereign remedy for inflammation, and that under the greatest diversity of circumstances; that it is, at times, a powerful antispasmodic; that it often relieves pain; that it sometimes promotes, sometimes restrains, the different natural discharges; that it either conciliates sleep or induces watchfulness, according to circumstances; one is forced, I think, to conclude, either that it possesses different and even opposite qualities to enable it to accomplish such various purposes, or, which is far more probable, that it acts upon some very general principle that is applicable to all. The most intelligible explanation of the matter appears to be this: that by any considerable loss of blood, however occasioned, a kind of shock is given to the system, in consequence of which, all vital movements, morbid as well as healthy, are more or less disturbed. In this respect, therefore, blood-letting resembles, in its effect, other sudden and powerful impressions on the system, whether made on mind or body, and whatever be the cause producing them. As instances in proof, I may mention the cold-bath —extreme pain—various noxious substances swallowed, as alcohol, and many others—and terror, as well as other violent mental emotions: all these are capable of exciting great commotion in the system, so as to influence and disturb, in greater or less degree, the most important functions of life; and with the further effect, on many occasions, of modifying, suspending, or even putting a stop altogether to various forms of disease.

That blood-letting possesses a similar power, and that in the highest degree, cannot be questioned. There is no one function, either mental or bodily, that is not more or less under the immediate influence of this agent, according to the manner in which it is applied, and the extent to which it is carried. It quickly and powerfully disturbs the heart and whole vascular system; as is evident not only from the changes induced on the pulse, but from the capillaries, in extreme cases, suddenly ceasing to contract, so as to allow their contents to escape in the form of cold sweats; respiration is disordered by it—the alimentary canal and urinary organs often discharge their contents involuntarily—and, lastly, the cerebral functions of sensation, voluntary motion, and thought, are impaired, disordered, or even wholly suspended, by a sudden and copious abstraction of blood. Nor are morbid actions by any means exempt from this influence (for disease is only a modification of healthy action, and is more or less under the influence of the same agents). In short, blood-letting, in checking or suppressing violent diseases of any kind, appears to act upon a principle very analogous to, if not identical with, what is called counter-irritation, but which in this case is, perhaps, better termed counter-impression.

Upon the principle now stated, namely, that of counter-impression, there is no difficulty in comprehending the superiority of venesection, in most instances, over the slower modes of drawing blood by leeches or scarification; and we at the same time readily understand why the same remedy should prove effectual for the removal of so many various forms of disease, as is found to be the case.

If, then, blood-letting really acts in the manner here suggested, and which there seems good reason for believing, it is obviously necessary so to administer it as to make the desired impression on the system at large, as the medium of influencing the local disease. It is also requisite that we should be well acquainted with the circumstances that give this a preference, or otherwise, over other modes of producing counter-irritation; for blood-letting is not always advisable for such a purpose, on account of the weakness of the patient at the time, although this oftener serves to modify, than altogether prohibit its use.

On the other hand, in cases, and under circumstances, to which blood-letting is well adapted, it is far more efficacious than the other modes of producing counter-irritation usually resorted to, such as blistering, the use of mercury, and the like; while it is free from any serious inconveniences to which these are liable, and which are often such as to render them wholly inexpedient.

# LECTURE V.

## ON THE DIFFERENT MODES OF BLOOD-LETTING.

Different methods are in use for taking away blood from the system, for therapeutic purposes; as, 1st, by phlebotomy, or venesection, where the blood is drawn from one or more of the larger external veins that are conveniently situated for the purpose; 2dly, by arteriotomy, or the puncture of an artery, which is sometimes resorted to; 3dly, by scarification of the superficial vessels, with or without the aid of the syringe, or cupping glass; 4thly, by leeches, which are likewise in frequent use. These different modes of abstracting blood from the system, have their respective advantages and disadvantages, which require discussion, the one mode being often applicable, where the others are less appropriate.

Now if it were simply by diminishing the quantity of blood in the system altogether, (as in the supposed case of plethora,) or even by reducing the general strength of the body, that blood-letting effects its purpose, it would be a matter of little moment by which of the ordinary modes in use the blood were drawn; for, in either way, the object sought for might be obtained; quantity alone being the thing required. But if blood-letting act, as I have endeavoured to show, by a kind of counter-impression, (not very unlike what is called counter-irritation,) the diseased part being influenced only in common with the rest of the system, or through the medium of the constitution, as it is termed, then something more than mere quantity is to be looked to: the blood should be so drawn as to make that impression upon the general system, from which the remedial effect, in most cases, appears to proceed.

In regard to this point, I wish to observe, that it is by no means always necessary, nor even desirable, that the evacuation of blood should be carried so far as to induce actual syncope or fainting, or even an approach towards it. The system may be sufficiently impressed, on all ordinary occasions, without going to such a length; as we learn from the result. There are in fact weighty objections to the practice of purposely inducing faintness, unless under peculiar circumstances. The occurrence of syncope is not only attended with distressing feelings to the patient himself, but is also apt to excite alarm in the bystanders: thereby making it the more difficult to recur repeatedly to the operation, as is often requisite. In the next place, fainting puts a sudden stop to the flow of blood, sometimes before a sufficient quantity is obtained to produce a permanent effect; for this depends much more upon the absolute quantity lost, than upon the rapidity with which it is taken. It is only in cases of great emergency, therefore, as where it is important to arrest the progress of the disease as quickly as possible, or to relieve some excruciating pain, that syncope should be purposely induced.

The different modes of drawing blood above enumerated, have been commonly arranged under the heads of General and Local. The former, or general blood-letting, consists in taking blood in any manner, and from any convenient place, without regard to the part immediately diseased; the remedial effect, in this case, taking place either by sympathy, or through the medium of the general system, as before stated. In the latter case, local or topical bleeding, the blood is taken, or presumed to be taken, immediately from the vessels of the diseased part, or those in its immediate vicinity. To the former head belongs phlebotomy, or venesection, and perhaps arteriotomy, though this, as ordinarily practised, has been looked upon more in the light of a local remedy; while scarification, with or without cupping, and leeches, are especially included under the head of local or topical bleeding.

It is natural enough to imagine that the taking the blood immediately from the part affected, must be more efficacious than when it is drawn remotely, as by venesection. But experience proves that in most cases diseases are more effectually influenced by general than by local remedies of any kind; that is, by acting upon the sound and healthy parts of the system, rather than by immediate applications to the diseased part itself. And it is fortunate that such is the case; for the most important and dangerous diseases are out of the reach of direct or local remedies, as with respect to inflammations of the different viscera. If these affections were only curable by means applied immediately to the affected part, we should be left on numerous occasions almost without a remedy. Instead of this, however, more advantage is found to be derived from the employment of venesection, purging, blistering, and sweating, (all of which are indirect or general remedies,) than by any of a local or topical nature.

In strictness of language, local or topical bleeding means the taking away blood, either from the vessels of the part affected, or from those in immediate connection with it. But this can be done in very few instances. We may puncture or scarify the parts within the mouth and nostrils, the tunica conjunctiva of the eye, the extremity of the rectum, and a few others: but what is often termed topical bleeding, (as distinguished from general,) has no title to be so considered; there being in most instances no direct communication of vessels, (none, at least, worth mentioning,) between the diseased part and that from which the blood is taken: as in the instances of cupping behind the ears, or at the back of the neck, or on the temples, in diseases of the brain, or on the skin of the chest, or abdomen, in diseases situated within those cavities.

But experience, we are told, proves that greater benefit is often derived from local than from general bleeding, although the quantity drawn be actually less; and with the further advantage of the general strength being less impaired by the former than the latter practice—a point, doubtless, of some importance where the patient is weak, and consequently unable to bear any considerable loss of blood. In such cases, therefore, topical blood-letting, in one or other of the modes mentioned, is often resorted to without hesitation, while venesection is rejected as injurious. Now if experience really prove this to be the case, you ought, unquestionably, to be guided by it. But it is difficult to say what really merits the name of experience; than which, as generally relied upon, nothing is more fallacious. There are so many obstacles to the arriving at a just and satisfactory conclusion on such subjects; so many sources of error in deciding upon medical facts, or what are so termed, that there is little ground for confidence in any case. It may be considered, I think, as sufficiently proved by experience, that, generally speaking, the system altogether is more quickly and sensibly impressed by venesection, than when the blood is taken by the slower modes of scarification, or leeching; and, which is of greater consequence, that the immediate effect on the disease is in the same proportion, although the quantity of blood drawn in the two cases be equal. In other words, the immediate, and, for the most part, the remedial effect, will be the greater, the more rapidly the blood is discharged. The permanent effect, however, is rather according to quantity. This, therefore, must be attended to, as well as the rapidity of drawing.

Topical bleeding, although far inferior to venesection, in the treatment of acute diseases in general, has nevertheless advantages that are peculiar to it; and which, on some occasions, entitle it to a preference. Scarification, with cupping, produces effects beyond that of merely discharging a certain quantity of blood from the system. It determines a flow of blood to the part and its neighbourhood; as is apparent from the redness and tumefaction occasioned by it. These effects continue for some time afterwards, and are followed by more or less of inflammation in the part. Changes of this kind, acting upon the principle of counter-irritation, may influence the disease as much as, or even more, than the actual loss of blood. If, then, more relief be really derived at times from topical, than from general blood-letting, (and which I am not disposed to question,) the superiority must be referred to a different principle, namely, that of revulsion, as it was formerly termed; or, as now better understood, the principle of counter-irritation—a matter quite independent of the mere loss of blood, which has been the point chiefly looked to.

Considering blood-letting, then, as acting, for the most part, upon the principle of counter-impression, as before explained—and that we sometimes wish to produce an immediate, but temporary—sometimes, a more durable, or permanent effect, (the former depending rather upon the rapidity of drawing, than upon mere quantity,) let us next inquire how far the different modes in use for abstracting blood from the system are adapted to these different ends.

1. *Venesection*, or *phlebotomy*.—The various purposes of bloodletting, as a medicinal agent, are, upon the whole, much more effectually answered by venesection, than by any of the other modes of drawing blood. If, for instance, the object be to take away blood so rapidly as to make a great and sudden impression on the system with the view of producing actual syncope or fainting, for any particular purpose, venesection is the most sure and effectual means we possess of so doing. If, on the other hand, we be desirous of obtaining a large quantity of blood, in order to produce a more lasting effect, without inducing syncope,—in this, as well as in the former case, venesection is still the preferable mode; because it is almost always in our power to regulate the velocity with which the blood flows from a vein; at the same time we are pretty sure of obtaining the desired quantity. By dexterously opening one or more of the larger external veins, either in the upper or lower extremities, or in the neck, (the external jugulars, which are both large in size, and of ready access), it is in general an easy matter to obtain blood, both in quantity, and with all the rapidity, that can be required. In a very few instances, however, it happens, that, from the smallness of the veins, or their being deeply-seated, or from a dread on the part of the patient, it is difficult, if not impracticable, to obtain blood in this way. In such cases, recourse must, of necessity, be had to some of the other modes in use for the purpose.

Much importance was formerly attached to the part from which the blood was to be drawn, in particular cases of disease. Bleeding in the foot, for example, was supposed to be better adapted to diseases of the head and neck, than the taking blood from the arm, while the latter was deemed more effectual for the relief of the thorax and abdomen. Drawing blood from the lower extremities, again, was thought to increase the action of the uterine vessels in a particular manner, and thereby to favour menstruation; and, on the same ground, it was thought, that in cases of uterine hemorrhage, bleeding in the foot rather tended to increase the malady, while bleeding in the arm would have the opposite effect.

I mentioned in a preceding lecture that it was formerly made a subject of fierce and lasting contention among the faculty, whether in cases of pleurisy, the blood should be taken from the arm of the side affected, or from the opposite side. Sydenham himself was imbued with this prejudice, for he insists on the superiority of taking the blood from the affected side. It is not difficult to trace the origin of these disputes. The discovery of the circulation had at first the effect of making the human body be viewed in the light of an hydraulic rather than an animated machine: and it was argued, accordingly, that whereas if one of two tubes, derived from the same common trunk, be opened, the momentum and velocity of the fluid passing through the corresponding branch is diminished, so the opening a vein in the affected side in pleurisy, would tend to diminish the force of circulation on that side altogether. The error here consists in supposing the blood-vessels to be mere passive tubes of conveyance, instead of being endowed, as they doubtless are, with an active, contractile, or, as it might be justly termed, a muscular power; by which, they contribute largely towards the movement of the blood.

These notions are now, I believe, pretty generally disregarded among British practitioners, as being inconsistent with sound physiology and pathology, while they are certainly not supported by any well-founded experience. They still appear, however, to be maintained by some of our continental neighbours; and, as usual, experience is appealed to in their behalf. The following may be taken as a specimen of what is deemed experience in such matters, as furnished by M. Freyteau, in an article in the *Dictionnaire de Médecine*, recently published in Paris:—

"A young female, eighteen years of age, subject to frequent and violent attacks of cerebral excitement, was seized with sudden blindness. Two bleedings in the foot having produced no good effect, she was bled in the right arm; when, immediately, the sight of the right eye was restored. She was then bled in the left arm, with the same good effect on the left eye. On a return of the blindness, the same plan was pursued, and with the same good result." From this it was inferred by M. Freyteau, that in various disorders of the head and neck; as hemiplegia, inflammation in the internal ear, ophthalmia, &c. the blood ought to be taken from the side effected. Now admitting that the facts here are fully and correctly stated, what do they prove, but that, where a first, or even a second bleeding has failed to cure, a third may succeed? The effect in the case described is with much more reason attributable to the quantity of blood lost, than to the part from which it was taken. It is the last bleeding always that cures.

Bleeding from the jugular vein has been said to induce fainting sooner than bleeding from the arm; and this has been accounted for by the existence of anastomosing branches, between the external and internal jugulars; which latter, you know, derive their blood direct from the brain. If the fact be really so, it would give a preference to the taking blood from the external jugular vein, for the relief of brain affections, rather than from the arm, or other part. It has also been said, that bleeding in the foot favours the production of syncope. This, if true, may, perhaps, be ascribed (in part at least) to the combined use of the pediluvium, in most cases of the sort, by which a greater determination of blood is made towards the inferior parts of the body.

The old practice of taking blood from a particular vein, as from the cephalic vein of the arm in affections of the head—from the right basilic, in those of the liver—and from the left vein of the same denomination, in those of the spleen, was evidently founded in an imperfect knowledge of the circulation.

2. *Arteriotomy.*—There are but few places where an artery can

be safely opened, or, at least, where the opening would not be followed by more or less of inconvenience. The temples, indeed, are almost the only part where arteriotomy is now practised; and here the branches of the artery are in general so small in size, as to make it by no means an easy matter, at all times, to obtain blood in quantity sufficient for our purpose; and still less in the way that is required to make a sudden and general impression on the system; while, in order to restrain the bleeding after the operation, it is often necessary to have recourse to so much compression of the external vessels of the head as is likely to disturb in some degree the circulation of the brain. It is at the same time clear, that the taking blood from a diminutive branch of the external carotid artery, can have little, if any, direct influence over the circulation of the encephalon, the supply of blood to which is derived from such different sources. On these grounds, therefore, arteriotomy seems to have no claim to the confidence that has sometimes been placed in it, as if it possessed advantages that cannot be obtained from venesection, or other modes of drawing blood.

A degree of importance has, by some, been attached to ateriotomy on another ground; namely, that the vitality of the system is more affected by the loss of arterial than of venous blood; the former being of a more stimulating nature than the latter. But this is probably not a matter of much moment. From whatever part the blood be taken, it will come to the same thing at last; when, for instance, a few ounces have run off from a vein, it is evident that what follows must be, as it were, arterial blood.

3. *Scarification*, with the aid of the syringe, or cupping glasses, ranks next to venesection, in point of efficiency, though still greatly inferior to it as a general remedy; because it is seldom that the blood can be so quickly obtained by this mode of drawing, as to produce a sudden effect, for the purpose of counter-impression, in urgent cases of disease, though a sufficient quantity of blood may often thus be procured for ulterior and more durable objects. On some occasions, however, the general system is quickly and powerfully impressed by this mode of taking blood, and that even to the extent of producing syncope; and, of course, with all the advantages derivable from venesection. This is sometimes the case in weakly adults; and still more frequently in infants, in whom venesection is not always practicable.

Simple scarification is sometimes practised with advantage, as a topical remedy, on parts where the vessels run superficially, and are easy of access. As, for example, on the tonsils, and other parts within the mouth; the inner nostrils; the tunica conjunctiva of the eyes and eyelids; and at the anus for the relief of hemorrhoidal affections. It is always a question, however, in these cases, whether more good or harm is done by the operation, on account of the local irritation produced by it. Upon this point, practitioners are found to differ; and experience, which is usually appealed to in these cases, as in many others, is not altogether so satisfactory and conclusive, as the advocates of different opinions are apt to imagine.

It is not altogether foreign to our purpose, to remark here, that cupping without scarification, or dry cupping, as it is termed, is an agent of no small importance, and applicable in many instances where loss of blood is objectionable. It acts powerfully as a counter-irritant; as is proved by the pain attending the operation, and by the increase of action it excites in the vessels of the part, and to some distance around. To this is attributable, probably, much of the advantage derived from the ordinary use of cupping with scarification, which may be said to possess at once the advantages of counter-irritation and loss of blood. Admitting this to be a satisfactory explanation of the matter, the end, perhaps, might be still better answered in such cases by blood-letting in the ordinary way, with the addition of blistering, or other mode of counter-irritation, in the vicinity of the diseased part.

Dry cupping alone is a useful means of producing counter-irritation on a variety of occasions, and is less resorted to than it deserves to be. It is, indeed, a very ancient practice, and is recommended both by Hippocrates and Galen, as well as by many modern writers. Vanswieten says he cured a violent inflammation of the eyes by this remedy, when all others had failed.

4. *Leeches* furnish another mode of drawing blood that has its advantages, as being applicable on some occasions, where other means cannot be conveniently resorted to. Generally speaking, however, as in regard to the other modes of local or topical bleeding, the blood drawn by leeches is discharged too slowly to have much effect on the general system, in the way of counter-impression. Infants, however, are sometimes quickly and powerfully affected, even to fainting, by the application of two or three leeches, which, so far, in them, may answer the purpose of general blood-letting, producing all the effect of venesection in the adult. There is one objection, however, to the use of leeches in children, which deserves attention; namely, the terror they sometimes occasion, with a continuance of angry feelings for an hour or two, while the operation lasts. This is a cause of aggravation in many brain affections of children, where the sensibility and irritability of the system are already greatly in excess. In such cases, therefore, scarification with cupping is often preferable to leeches; and, still more, venesection, if it be practicable, as it often is, either in the arm or neck. By this, not only is the irritation here spoken of avoided, but the disease itself more effectually relieved.

In adults of ordinary strength, leeches, in whatever number applied, are rarely effectual, as a substitute for general blood-letting, in cases of active inflammation, especially if attended by febrile symptoms. By the application of a sufficient number of leeches, a large quantity of blood may, no doubt, be drained from the body, and a corresponding degree of weakness induced; but still often without making that general impression on the system which is necessary to interrupt the progress of the disease. I may mention the following as an example:—

A gentleman, whom I attended not long ago, when suffering under active inflammation in the abdomen, had had 250 leeches applied, in relays of fifty or sixty at a time, and all within the space of three or four days. On a moderate calculation he could not have lost less, in this way, than five or six pounds of blood. The face had become pale in the extreme, and there was a great reduction of the general strength; still no impression was made upon the disease. But upon taking away eight ounces of blood rapidly from the arm, by venesection, slight faintness ensued; the disease immediately began to decline, and quickly subsided altogether.

### *Of the Circumstances usually deemed favourable, or otherwise, to the Employment of Blood-letting.*

It is absolutely necessary that you should become acquainted with the indications and contra-indications (as they are technically termed), which govern the use of blood-letting; for without attention to these, the remedy can neither be properly nor safely administered. Suppose, for instance, a person to be seized with apoplexy, —you are not immediately, and without consideration, to bleed him largely; because there are cases of this disease in which such a remedy is not at all requisite, and where, in fact, it would do harm rather than good. It always depends upon the circumstances of the individual case before you, and not upon the name merely, whether the remedy be proper or otherwise.

Among the circumstances especially relied upon, as furnishing a guide to blood-letting in general, strength and weakness may be mentioned. Now with respect to these, I may observe, that general strength of system is so far favourable to its employment, that where the disease is of such a nature as seemingly to call for this remedy, we feel little hesitation in resorting to it; and on the other hand, general weakness of system is always, of itself, a discouraging circumstance. But although both strength and weakness serve at all times to regulate and modify more or less the use of blood-letting, they are neither of them wholly and exclusively to be relied upon. It is not every strong subject that requires this evacuation, even although the disease be what is termed inflammatory; for the nature of the disease may be such that, under ordinary circumstances, it may be safely left to itself, as where it is seated in parts of secondary importance, and where its known tendency is to subside spontaneously after running a certain course. This is the case very generally with inflammation of the mucous membrane, as in catarrh, diarrhœa, and others of the same description. On the other hand, it is by no means always necessary, or even safe, to abstain from blood-letting merely because the patient is weak; for the same forms of disease occur in the weak and in the strong, and the same general principles of cure are applicable in both, though, of course, with proper qualifications. In illustration of this I may mention the following case:—

A weak and delicate girl, 17 years of age, had been affected for some weeks with a severe dry cough, with great heat and soreness over the whole chest. The face was pale and bloated; the flesh soft and flabby; the tongue white, but moist; the pulse frequent, and rather weak than strong; the breathing not laborious, but short and quick, in correspondence with the pulse; and the lower extremities were generally cold, and disposed to swell.

The disease here, you perceive, was catarrhal, *i. e.*, the mucous membrane that lines the air-passages was inflamed. This variety of inflammation, though not, generally speaking, dangerous in itself, is very apt, when neglected, in young persons more especially, to spread to the substance of the lungs, so as gradually to undermine their structure, and thereby lay the foundation of future phthisis. In the present case the feeble and chlorotic state of the patient seemed to call rather for the use of tonics than of debilitating remedies of any kind; and it was not, in fact, till the employment of chalybeates, and others of the like description, had produced a decided aggravation of the cough and febrile symptoms, that I ventured to prescribe bleeding from the arm, though only to the extent of four ounces, and in the recumbent posture. The blood drawn exhibited an enormously large proportion of serum; yet the coagulum was firm in consistence, and both buffed and cupped on the surface. The result was as favourable as could be wished. The heat and soreness of the chest disappeared, expectoration took place, and the cough gradually ceased. The same tonic remedies that had before proved injurious were now recurred to, and with the best effect, and the health was quickly restored.

The *pulse* at the wrist has been more appealed to, perhaps, than any other sign, as indicating the propriety of blood-letting or the contrary. Yet there is hardly any that is more equivocal; or about which more erroneous notions seem to prevail. The condition of the pulse is influenced by so many circumstances, some of them of a very trivial nature, that little reliance is to be placed upon it, without the concurrence of other signs. In the first place, I may remark that the pulse at the wrist by no means always represents the state of the general circulation; and still less is it to be relied upon as indicative of the general strength of the system. You will often find, for instance, the heart acting violently, and driving the blood with great force into the large arterial trunks immediately connected with it, without at all affecting the pulse at the wrist, which may be, at the very time, small and feeble. The same state of pulse, with cold extremities, often occurs where the arteries of the head, both internal and external, are throbbing violently, with a great increase of heat in the whole head.

A full and strong pulse is generally considered as a justification of bleeding, in cases apparently calling for this evacuation: yet this, of itself, is a fallacious sign. Such a state of pulse may be temporarily produced, at almost any time; as by immersion for a few minutes in the hot bath, or even by the pediluvium, if continued for a longer time; by violent exercise; or by the use of various internal stimulants, especially if combined with opium: and this will take place under circumstances that neither require nor admit of the use of blood-letting. In apoplexy, also, the pulse often retains its strength and fullness, long after all hope of recovery has vanished, and when bleeding would only tend to accelerate the fatal event. In the hot fit of an ordinary intermittent, likewise, and in various instances of what has been called Ephemera, or simple inflammatory fever (synocha), blood-letting, though well enough adapted to the nature of the complaint, may often be dispensed with, as not being essential, though it is sometimes called for by the urgency of the symptoms. In the small-pox, again, even when confluent, the pulse, in the early stage, is generally strong and full; yet, as the disease is specific, and has a peculiar and determined course to run, which art has little or no power to prevent (though it may impede and disturb,) it is questionable whether injury, rather than benefit, would not be the result of bleeding, unless used with much reserve, and as a palliative merely, at the outset of the disease.

The pulse sometimes gives an idea of strength that is fallacious, and apt to mislead us in practice. I allude to that apparent fulness and strength of pulse, which are observed in old people of emaciated habits; in whom the artery passes near to the surface, and is at the same time indurated by age. This you are always to make allowance for. On the other hand, a pulse that is deficient in fulness, and even in strength, is not always prohibitory of bleeding. Exposure to a cold atmosphere, and, still more, the cold bath, will produce such a degree of constriction of the external vessels, as will render the pulse at the wrist, for the time, so small as to be nearly imperceptible. Terror has a somewhat similar effect. In the erect posture, also, the pulse will often be small and feeble; where, on lying down, it immediately acquires both fulness and strength, especially if seconded by the warmth of a bed.

The pulse is found to vary considerably at different periods of the day, from causes that are not always perceptible. Thus it is sometimes small and feeble in the morning, while in the evening it may have acquired both strength and fulness. Such alterations of the pulse take place without any material change in the general strength of the system, or in the state of the disease itself; they afford, therefore, no conclusive reason either for or against bleeding. In such cases, a more general view of the subject must be taken.

If, for instance, the disease present be evidently such as generally requires bleeding for its relief—if it be recent, and taking place in a habit of known vigour, and where no considerable loss of blood or evacuation has already occurred, so as to have reduced materially the general strength—the mere feebleness of the pulse affords no decisive objection to blood-letting, as being rather a sign of irregular distribution of the blood, than of real debility.

Again, at the commencement of many fevers and inflammations, the pulse is observed to be small and weak, even in habits of known strength previously. And this is more especially the case if the patient be in an erect posture, and placed in a cool atmosphere. Such a state of the pulse is apt to convey to the mind of the practitioner an idea of extreme debility, which the feelings of the patient appear to confirm. This, however, often disappears after bleeding, and the pulse rises, as it is termed. The same thing frequently occurs after the infliction of severe injuries of any kind on the body; and also from great and sudden emotions of mind. This state has been called collapse, (though without any distinct meaning affixed to the term,) and has been regarded as altogether adverse to bleeding, the state of re-action being waited for in order to justify the employment of the lancet; danger, even being apprehended from the use of it under these circumstances. Such an apprehension, however, is for the most part groundless. The state of collapse here mentioned is not a state of absolute weakness, or an actual loss of vital power, but a temporary depression or prostration of strength, or rather of action, the result of a general disturbance of functions, produced by the disease or injury, and which generally subsides of itself after a time, or as soon as the disturbance is quelled by any quick-acting stimulus, such as ammonia, or a glass of brandy. That the apprehension entertained with regard to the danger of this collapse is for the most part groundless, is further shown by the safety with which blood-letting may be had recourse to in the cold fit of an intermittent; as I well know by my own experience, and as has been sufficiently proved by others. The object of blood-letting, in such cases, is not that of calming the general disorder, but rather to prevent future ill consequences, especially inflammation, which is almost sure to follow, in greater or less degree. The reaction, as it is called, that succeeds such injuries, is generally nothing more than the febrile state produced by the inflammation, which early blood-letting is calculated to mitigate, if not wholly to prevent the occurrence of. By delaying the bleeding, therefore, till the inflammation is fully established (as is often the case where re-action is waited for), it becomes more difficult to arrest the progress of this afterwards. The extent to which it may be proper to carry the blood-letting in such cases, is, no doubt, of importance, and must, of course, be governed by the actual strength of the system. But this is to be estimated by other signs than the pulse; especially by the known state of the patient, immediately before the receipt of the injury.

The pulse is sometimes obscure, a state that may mislead us, by suggesting the idea of weakness where, in reality, it does not exist. This state of the pulse occurs where the artery is deeply seated, being thickly covered with adipose substance, so as to be difficultly felt, or distinguished as to its properties, either in regard to fulness or the strength with which it is beating. In order not to be deceived in this case, it is necessary to press strongly with the points of the fingers upon the artery, and to examine it with close attention for some time; by which its real condition, in regard to strength and fulness, may generally be ascertained.

Frequency of pulse, when considerable, has often been supposed to indicate the propriety of blood-letting; and preternatural slowness, the contrary. But neither of these is of much weight, without attention to other circumstances. Unusual frequency or slowness of the pulse, are often constitutional, and unconnected with disease of any kind; and the same may be said of irregularity of pulse, which is often met with in persons enjoying the best health. Sometimes, too, this irregularity disappears under disease, and recurs again as health returns. Nor must it be forgotten, that the size and distribution of the arteries at the wrist are subject to great variety, in different individuals, so as to prevent our drawing any indication at all from the pulse in such cases. I find a striking instance of this recorded in my note-book, where the patient had been labouring for some days under great difficulty of breathing, with severe pain in the chest, and a flushed face. No pulse was to be felt in either wrist; and this circumstance had naturally enough deterred the practitioner in attendance from having recourse to the lancet. This apparent inconsistency of the pulse with the other signs, all of which indicated general vigour of system (for the patient was in the prime of life, and, a few days before, was in high health), led us to suspect that there might be such an irregularity in the distribution of the arteries of the fore-arm as is alluded to above. This, upon examination, we found to be the case, and all doubt in regard to the treatment was at an end.

There is, nevertheless, a state of pulse that is always extremely unfavourable to blood-letting, if not altogether prohibitory of it: I mean, where it is at once small, soft, and compressible by the slightest force. But this is sure to be accompanied by other unequivocal signs of extreme weakness, that cannot well be mistaken.

Upon the whole, I may observe, that there is hardly any condition of pulse, either in regard to strength or weakness, fulness or smallness, hardness or softness, frequency or slowness, regularity or irregularity, which, taken singly and in all cases, either absolutely calls for, or prohibits, blood-letting. Much attention, doubtless, is due to all of them. Each may serve as a guide, in regard to the quantity of blood to be drawn, the repetition of the operation, and the like; while, taken in conjunction with other circumstances, it may serve to determine the propriety of the evacuation altogether. We shall have occasion to recur to this part of the subject, when speaking of the use of blood-letting as a remedy for inflammation—by far the most important purpose for which it can be applied.

# LECTURE VI.

## OF THE QUANTITY OF BLOOD REQUIRED TO BE DRAWN FOR MEDICINAL PURPOSES; AND THE ILL CONSEQUENCES OF EXCESS.

It were much to be wished that any general rule could be laid down, upon which we might rely with confidence, for determining the quantity of blood required to be taken away in particular cases of disease, (due reference, of course, being had to age and other obvious circumstances) in order that while enough was done to insure the end we have in view, we might avoid carrying the evacuation to a hurtful extent. But, however desirable, it will be found a most difficult task to accomplish. The circumstances requiring attention, as more or less influencing the result, are so numerous and various, some of them, probably, but imperfectly understood, that we may despair of arriving at any thing like certainty or precision on the subject. Not only age and strength, but mode of life and peculiarity of constitution—season and climate—the nature, stage, and even the particular seat of the disease, have all a marked influence on the result. Thus it is found that in one individual the abstraction of six or eight ounces of blood accomplishes all we wish; while, in another, twenty or thirty ounces are required for the same purpose. On one occasion, the disease yielding to a single blood-letting; while, in others, many repetitions of the operation are required, to produce the desired effect. These differences do not depend merely upon the strength of the patient, but upon the disposition there may be at the time to the continuance of the diseased action, whatever this may be. This disposition is not only different in different individuals, but appears to be continually changing; while it is not possible to judge of it by any obvious signs. Hence the uncertainty of our art, that has been so long and so justly complained of.

Speaking generally, however, in regard to quantity, it may be stated, that in adults of middling stature, and of good general health, from eight to ten or twelve ounces may be considered a moderate bleeding, and that from sixteen to twenty ounces may be deemed large. There are, however, many cases of violent and recent disease, in which the largest quantity here mentioned may be safely and properly exceeded. On the other hand, in diseases of long standing, where a cure is only attainable after a considerable lapse of time, it is hardly ever advisable to bleed largely at once. In such cases, the quantity of blood proper to be drawn at one time should seldom exceed five or six ounces; this being commonly enough to make a salutary impression on the system. A repetition, however, of the evacuation to the same amount, is generally requisite, on such occasions, and may be borne for a great number of times, at reasonable intervals, without inconvenience, and with the most unequivocal advantage: as in many chronic affections of the lungs, heart, and various other organs, which you will find to be most successfully treated in this way.

There are, no doubt, many urgent cases of disease in which it may be justifiable to carry blood-letting to a much greater extent than I have now stated, both as regards quantity and repetition. No precise rule, however, can be laid down on the subject. All I shall attempt in this respect is, to show you, by examples drawn from various and unexceptionable sources, what, in particular instances, has actually been done, not only without any immediate danger, but with decided advantage to the patient.

Hippocrates, as well as other of the ancient writers, recommend bleeding the patient to syncope in acute disorders; but without, in any instance, mentioning the precise quantity of blood proper to be drawn. Galen seems to have been the first to do this, and he cites, as an extraordinary event, a case of violent fever, in which 54 ounces of blood were taken in a single day.

Vanswieten observes* that he knew a woman who, on account of some mental disorder, had been bled more than sixty times in the space of a year; during which she grew extremely corpulent. Dodart,† a French physician, remarks, that upon 16 ounces of blood being taken from a man, previously in good health, the loss was repaired in the short space of five days—meaning, I suppose, that the body acquired, in that time, its former weight. This, however, you will observe, is rather equivocal; for the loss of weight might have been partly supplied by aqueous absorption from the atmosphere. Dr. Rush,‡ of Philadelphia, says, that 90 ounces were taken at one time from his friend, Dr. Dewees, and with advantage. The latter physician, Dr. Dewees, himself states that he took 80 ounces of blood, within a few hours, from a young and delicate woman, who had been seized with convulsions towards the end of pregnancy; and from another similarly affected, at the commencement of labour, he drew 120 ounces within five or six hours, and 20 more on the following day. The patient notwithstanding, he says, recovered rapidly, but became blind, and continued so for a fortnight, and did not perfectly recover her sight for six months after. I may observe here, by the by, that you are not hastily to conclude, as some might do, that the blindness in this instance was caused by the loss of blood; a much more rational cause is to be found in the affection of the brain that first gave rise to the convulsions. The same writer cites various other instances, where a similar practice was pursued, and with the same good effect.§

Dr. Frank, of Vienna, relates, that he bled a person, 80 years of age, nine times, in order to relieve him from pneumonia. The late Dr. James Currie, of Liverpool, was bled to the extent altogether of 200 ounces, between the months of October and May, and was apparently rescued by this from pulmonary consumption. He lived for many years after in the extensive practice of his profession, and in the enjoyment of good health, though he ultimately fell a victim to the same disease.* Dr. Barlow, one of the writers in the Cyclopædia of Practical Medicine (art. "Plethora"), mentions the case of a feeble and emaciated boy, who was labouring under diabetes, and from whom 209 ounces (lb. 13) were taken at twelve successive bleedings, in the space of 51 days; which is at the rate of 19 ounces to each bleeding: he was bled twice a week, on the average. The effect, Dr. B. says, was striking: from a state of feebleness, hardly admitting of an erect posture, the lad acquired a degree of vigour which enabled him to hold the plough for several hours a day. The blood, too, from a dark grumous coagulum, of loose texture, exhibited afterwards the thickest and firmest buff. In another case, of a weakly and delicate female, without any special disease or local ailment, except pains irregularly alternating in the head and chest, 106 ounces (nearly lb. 7) of blood were taken, we are told by the same author, at seven bleedings, (*i. e.*, 15 ounces each time, on an average), with a similar change in the appearance of the blood, and a well-marked improvement in the general strength.

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* Commentaries, 12mo. vol. 1. p. 282.

† Histoire de l'Acad. des Sciences, an. 1772, 134.

‡ Med. Inquiries, vol. iv. p. 239.

§ See Dictionnaire de Med. p. 23. et seq.

The following, as well as many of a similar nature, came under my own observation at the General Dispensary, and were noted down at the time.

E. J., æt. 14, a delicate girl, affected with chorea. She was bled 17 times between the months of December and March, 1823, losing from 4 to 6 ounces at a time. At the end of this period she had recovered her ordinary health and strength, and the convulsive movements had almost totally ceased.

I find mention, also, in my note-book of October 1832, of the case of a young woman, 18 years of age, who, three years before, was a patient at the Dispensary, labouring under epilepsy, which had recurred frequently for a year or more previously. She was treated principally by small bleedings, from 6 to 8 ounces at a time, and was bled at least 60 times in the space of a year and a half—often at her own urgent request, on account of the relief she always experienced from the evacuation The fits left her gradually; and, for the last year and a half, have not recurred. She is now in good health, and as florid in complexion as if no blood had been drawn.

July, 1836.—Mrs. M., whom I saw in consultation with my friend Mr. Coward, has suffered various attacks of inflammation at different periods, for some years back. The uterus, the chest, and (latterly) the brain, have all been affected in turn, and with so much violence, as to call for frequently-repeated blood-letting, which has always been productive of great, though only temporary, relief. A minute account has been kept of the different bleeding she has undergone, from which it appears that she has been bled 58 times in the arm, and been cupped 5 times; the quantity of blood taken at a time varying from six to eight, to ten or twelve ounces; besides which, she has had applied, at different times, at least 1000 leeches. Her complexion, after all this loss of blood, is not remarkably pallid, nor is she much emaciated, although her diet has been of the simplest and scantiest description. For the last year or more she has (with very few exceptions) subsisted solely on Scotch oatmeal, a few teaspoonfuls at a time, taken in the dry state, and washed down with water or weak tea; the stomach refusing all other food.

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* Life of James Currie, M. D., by his Son.

I saw lately a young and generally healthy man, who, on account of disordered action of the heart, which was supposed to originate in inflammation, had been bled five times in as many days—to the extent of two pints on each of the two first bleedings—a pint and a half on the two succeeding ones—and a pint on the last occasion. This quantity seemed to me to be unnecessarily large; and, in fact, it had not accomplished the object aimed at—that of quieting the disordered action of the heart. This, however, was effected in the space of two or three weeks, by the use of small doses of opium, with a moderately nutritious diet. No *œdema* of the extremities followed, nor other inconvenience, and the patient soon recovered his ordinary strength.*

The statement you have just heard is not brought forward as a matter for imitation, on ordinary occasions, but only to show, that where urgent circumstances appear to demand the employment of such active means (as being presumed necessary to the immediate safety of the patient), we are justified in having recourse to them, where other means fail. At the same time you should constantly bear in mind the evils that may arise from an intemperate or excessive use of the remedy, so that you may at all times resort to it with all the caution that the circumstances allow of.

Before quitting this part of our subject, I cannot avoid adverting to some late attempts that have been made to lay down precise rules for the safe and effectual administration of blood-letting, because they appear to me not sufficiently in accordance with general experience, and liable, if acted upon, to lead at times to dangerous results. I feel myself the more called upon to do this, on account of the distinguished rank which the author holds in the profession, as well as from his being a teacher in one of the most respectable medical schools of this metropolis—circumstances that cannot fail to give considerable weight to his opinions.* The rule he lays down is thus enunciated:—

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* For examples of boldness in the use of the lancet, I may refer you to the practice of some of our surgeons. In one of the great hospitals of this metropolis a case occurred lately, where 128 ounces of blood (8 lbs., or 1 gallon !) were drawn at one time, in order, by inducing syncope, to facilitate the reduction of a dislocation of the thigh. The patient lived a week afterwards, and then, as is said, died from inflammation of the vein punctured. A still more extraordinary account is given in a late Treatise on Blood-Letting, where it is stated by the author, in an unqualified manner, that "he has known instances of delicate females losing, *daily*, from half a pint to a pint of blood, from hemorrhoidal tumors; and that for many months, and even years!" I confess I have seen nothing approaching to this.

"If, in any case, we place the patient upright, either sitting or standing, and bleed to incipient syncope, we abstract precisely the quantity of blood which the patient will bear to lose, and also which the disease requires to be withdrawn for its relief." "These two facts," it is added, "are precisely commensurate with each other; so that to bleed to incipient syncope, is to bleed precisely according to the exigencies of the case." Nothing can be more simple or intelligible than this, and nothing, certainly, more important in regard to practice, if well founded; but this I am disposed to question.

There are here two distinct propositions; either of which may be true or false, without affecting the other. The first is, that an approach to syncope (where the patient is bled in the erect posture) is a test of the quantity of blood that he can bear to lose; or, in other words, that may be drawn with safety, or without danger to life. This may be, and, generally speaking, probably is true; but I know of no sufficient proof derived from actual experience of its being so. It is plain that such a fact could not be established by previous reasoning, or upon physiological grounds. Nothing but actual observation, and that upon a large scale, or else direct experiment, could establish such a point. But it is not, and has not been, the custom to bleed patients in this manner; so that nothing like general experience can be appealed to in its behalf. As little can it be imagined, that it is in the power of any individual to institute a sufficiently extensive series of experiments on such a subject; and it is a matter of too great moment, practically speaking, to be admitted on narrow or trivial grounds It is not known what quantity of blood the system will bear to lose consistently with life, the quantity probably differing greatly in different individuals. But it is certain that very different quantities may be lost before syncope occurs, this depending not merely upon the posture in which the patient is placed, but upon the manner of drawing, and the rapidity with which the blood is taken, as before stated. The approach of syncope, therefore, can never afford a precise rule for our guidance, unless it could be shown that quantity has no influence in the production of that state. It is far from certain that actual syncope can at all times be induced without danger to life; nor can we regulate its approach with any certainty. A person, it is well known, will bear to lose a much larger quantity before he faints, when the blood flows slowly, than when it is rapidly drawn. The drawing it slowly is much the same, therefore, as if he were bled lying down. If, then, as the author admits, it be dangerous to bleed to complete syncope in the recumbent posture, the same danger is likely to be encountered where the patient is bled slowly while erect; so that the safety of the rule here laid down may be justly questioned.

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* See an Essay on Blood-Letting, by Dr. Marshall Hall; and also a paper of his, on the same subject, in the Cyclopædia of Practical Medicine; likewise, the abstract of his lectures, as published in some late numbers of the Lancet.

The author's second position, namely, that "to bleed to incipient syncope is to bleed precisely according to the exigencies of the case," appears to me to be equally untenable, and in opposition, indeed, to almost daily experience. It would seem to be the author's opinion, that the occurrence of syncope is the circumstance upon which the cure depends, and not at all the quantity of blood lost. It is true, doubtless, that during the state of syncope the diseased as well as the healthy actions of the system are suspended; but this suspension is in general only temporary, the diseased action being renewed as the patient recovers from the fainting state, and not seldom with all its former violence. This is especially likely to happen where fainting comes on when only a small quantity of blood has been lost. The occurrence of syncope, therefore, and still less an approach to it, is not a precise measure of the quantity of blood required to be drawn for the relief of any particular disease. Many diseases cannot be cured without repeated abstractions of blood; nor is the necessity for these lessened, in such cases, by the occurrence of syncope, which, indeed, contrary to what is here stated, takes place more readily on the first bleeding than on the subsequent ones. The rule is objectionable, too, in another respect, as leading, in many instances to an unnecessary waste of blood. The abstraction of eight or ten ounces of blood, for example, will often suffice for arresting the progress of inflammation, without the least tendency to syncope being perceived; so that the disease will immediately begin to decline, and at length go off altogether, without any further loss of blood, though several days may perhaps elapse before the disease wholly subsides. By carrying the bleeding, therefore, to the extent of inducing syncope in every case, as here suggested, an unnecessary quantity of blood will often be lost—a thing always to be deprecated.

### *Of the Evils resulting from excessive Loss of Blood, and the Means of obviating them.*

Many objections have been made to the practice of blood-letting, some of which are of a very frivolous nature. It is, for instance, a vulgar, I hardly need add, an unfounded notion, that the first bleeding always cures. In reliance upon this notion, the remedy is sometimes postponed till its use becomes equivocal, if not improper; or, at all events, much less advantageous than it would have been if employed at an earlier period. Another objection is, that if the practice of bleeding be once begun, a habit will be formed, so that it cannot afterwards be dispensed with. But there is little more foundation for this opinion than the former. It is objected, again, by some, that the practice is an unnatural one, and that it is even irreligious, and in opposition to Scripture; which says, "The blood is the life," and that the taking away life is prohibited by the laws of God and man." This hardly merits a serious answer. We are daily called upon to avert a greater evil, by voluntarily encountering a lesser one. We part with a limb in order to preserve life. If by blood-letting we can prevent the body from falling a prey to an otherwise indomitable malady (as is unquestionably often the case), surely no argument is needed to prove its propriety. When I tell you confidently, as I am warranted by general experience in doing, that blood-letting is, in innumerable instances, essential to the immediate preservation of life; and further, that by the neglect of it, a foundation is often laid for diseases of a chronic kind, that are even more fatal in their consequences than the most acute, you will not, I trust, be deterred, by futile and unfounded objections, from the performance of a great and obvious duty. In resorting to this, as well as to all other powerful remedies, we have only to inquire whether the object sought be of sufficient magnitude, in comparison with the existing evil, to warrant the adoption of such a remedy; if it be, we have our justification, and we incur great moral responsibility, if we hesitate. You are to remember, that the blood is in a state of constant renewal by the food that is daily taken; so that, in favourable circumstances, the loss sustained is soon again supplied. Blood-letting, therefore, does not necessarily occasion any permanent loss to the system; nor does it, generally speaking, produce other unfavourable changes in regard to the general health—always, of course, supposing that the remedy is used with due discrimination and judgment. The arguments, in short, that may be adduced in favour of the practice, (when properly conducted,) outweigh, a thousand-fold, every thing that can be urged against it.

A great dread of blood-letting prevails, (a dread in which not a few of our professional brethren seem to participate,) on account of its supposed tendency to produce dropsy, if carried at all too far. Under this apprehension, practitioners often abstain from bleeding, even in acute cases of inflammation, or, at least, are apt to discontinue its use before the object is sufficiently attained. The consequence often is, that the inflammation continues, though perhaps in a subdued and half-cured form, yet quite sufficient to lay a foundation for chronic diseases, of different kinds and denominations, according to the nature of the part affected. Thus, (to give you two or three examples,) if the lungs be the part primarily affected, the long continuance of the inflammation, even in the slightest degree, gradually alters their structure; they become indurated (tubercular), impervious to air, (hepatized, as it is absurdly called), and more vascular, giving a tendency to hemorrhage (hæmoptysis). These, again, prove sources of disturbance to the whole vascular system, exciting a febrile state (hectic), with its usual concomitants, night-sweats and emaciation: in a word, giving rise to that frightful train of generally irremediable symptoms that constitute what is familiarly called Consumption or Decline, the great destroyer of life at the most interesting period of human existence, and which, in a large proportion of instances, may be traced to neglected or half-cured inflammation.

In like manner, where the mucous membrane lining the air-passages becomes affected by inflammation (catarrh, or bronchitis, as it is now more generally termed), especially when the disease extends pretty generally throughout the bronchial tubes, the affected membrane swells, and becomes thickened in its texture, so as to offer a mechanical impediment to the passage of air into and out of the lungs; with other symptoms that I need not here dwell upon. Now, in favourable cases of this sort, the inflammation generally subsides in the space of a few days; terminating, commonly, by a large formation and expectoration of mucus. But if the tendency to the disease be strong, and the inflammation often renewed, or if it be imperfectly cured, either by the employment of inadequate means, or by an insufficient use of such as are really effective, (especially blood-letting, which, in severe cases, is the only one deserving confidence,) the membrane is permanently thickened by the inflammation, till breathing becomes a matter of labour and difficulty; subject also to occasional exacerbations, that require immense efforts on the part of the respiratory muscles, in order to sustain life while the paroxysm lasts. Here you have a picture of confirmed or periodical asthma—a disease over which, when confirmed by habit, art has little influence, even so far as to afford temporary relief.

So again, if the membrane lining the close cavities of the body, the cranium, chest, or abdomen, be attacked by inflammation, and this be continued for a certain time, and in a certain degree, it is followed either by adhesion (a growing together of the inflamed surfaces) or by a preternatural secretion (effusion, as it is unmeaningly termed) of serous fluid into the cavity; and thus dropsy is formed—not produced, as commonly supposed, by blood-letting, but rather by the neglect of it, the inflammation being allowed to run on till it has produced one or other of the consequences mentioned. In short, dropsy is very generally, I believe I might say universally, a mere consequence of inflammation; at least I have never seen an instance that seemed fairly ascribable to blood-letting. The utmost in this respect that can be attributed to loss of blood, however occasioned, is an œdematous swelling of the lower extremities, owing, probably, to the weakened state of the capillaries and absorbents, but which hardly merits the name of dropsy, and which, as far as I have seen, is never formidable in its results.

The greatest loss of blood consistent with life, is that, probably, which occurs in cases of flooding in females; and in regard to this, I have repeatedly made inquiries of the most experienced accoucheurs, whether they ever witnessed any determined case of dropsy (I do not mean a mere œdematous swelling of the lower extremities, which is only a temporary inconvenience), occasioned solely by the loss of blood. Their answer has always been decidedly in the negative.

These, however, are not the whole of the evils that have been ascribed to loss of blood, when carried to excess. In the writings of Dr. M. Hall, above alluded to, you will find a variety of symptoms, and even primary forms of disease, attributed to this source—whether justly or otherwise remains to be seen. It is asserted, for example, that "delirium occurs as an immediate effect of loss of blood; and that mania or delirium, in a more or less continued form, is not an unfrequent occurrence, as a more remote effect of the same cause—that puerperal mania generally arises from loss of blood in those who are predisposed—and that a form of mania, not to be distinguished from puerperal mania (except by the history of the case), occurs likewise from loss of blood, independently of parturition;" and he goes on to say, that "coma, amaurosis, deafness, and paralysis, are other forms of the effect of loss of blood."

If such are really and unequivocally the effects of loss of blood, it is somewhat strange that they should not have been particularly noticed by practical writers in general. But, as far as I know, this has not been done. The author goes even further than this, and points out the following as taking place in what he terms "exquisite cases of the sort":—"intolerance of light and sound,—agitated sleep,—delirium,—noises in the head,—flashes of light,—a sense of pressure or tightness in one part of, or around the head, as if the skull were pressed by an iron nail, or bound by an iron hoop;" and along with these, "a throbbing of arteries in the head, and beating of the carotids; with an increase of action of the heart and arteries in general." The train of symptoms here described, taken together, I barely need remark, used formerly[*] to be considered as indicating phrenitis or inflammation of the brain; and indeed, if they do not do this, it is hard to say of what use at all symptoms are, for the purposes of diagnosis. Here, however, they are ascribed to re-action (a favourite term), by which is meant a state of general arterial excitement, or increased arterial action, and altogether independent of inflammation. It would almost appear, indeed, from the statement here made, that the greater the loss of blood, the greater will be the re-action that is to follow. That such a train of symptoms, however, should occur, as an effect of loss of blood simply, is scarcely credible in itself; and is not in accordance with any facts I have ever witnessed; nor is it supported, I believe, by any satisfactory testimony. That loss of blood occasionally (though by no means constantly) induces irregularities in the general circulation, and, more especially, violent action of the cerebral arteries, is well known; but such effects, besides that they are by no means constant, are temporary only, and always accompanied by diminished action in the rest of the arterial system. Indeed it seems physically impossible that the whole, or nearly the whole arterial system, should, as here stated, be throbbing with violence, after it has been emptied of a large proportion of its blood. I would appeal to cases of simple hemorrhage, without disease—such as occur after accidents or surgical operations—to prove that such a train of symptoms as is here described is not the natural or ordinary result of loss of blood.

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[*] *Géronte*—"Il n'y a qu'une seule chose qui m'a chequé; c'est l'endroit du foie et du cœur. Il me semble que vous les placez autrement qu'ils ne sont; que le cœur est du côte gauche et le foie du côté droit.

*Sganarelle*—"Oui, cela etoit autrefois ainsi; mais nous avons changé tout cela; et nous faisons maintenant la medecine d'une methode toute nouvelle.

*Géronte*—"C'est que je ne savois pas, et je vous demande pardon de mon ignorance."—*Le Medecin malgré lui.* Act 2; Scene vi.

The fact, I believe, is, that the author has drawn his conclusions from the puerperal state principally, and not from ordinary cases of hemorrhage, whether the result of injury or induced by art. The cerebral symptoms described above as the direct effect of loss of blood, are occasionally, no doubt, met with in puerperal cases, where considerable hemorrhage may have taken place; but the same symptoms occur where there has been little or no loss of blood. They are not, therefore, justly ascribable to the cause here assigned. Inflammation of the brain is an event far from infrequent after parturition, and would, of course, be attended with, or followed by, the symptoms here mentioned,—namely, "intolerance of light and sound—agitated sleep—delirium—noises in the head—flashes of light, and throbbing of arteries in the head," &c.; and, along with these local signs of inflammation, "an increase of action of the heart and arteries in general." All the circumstances attending child-birth, it is to be remembered, are powerful causes of excitement to the brain, and fully adequate to the production of inflammation in this part: such are, for example, the mental anxiety, the dread, and the great muscular efforts, that necessarily precede and accompany parturition. And if a predisposition to inflammation in the brain exist, as appears to be the case in some women, the same effect will be likely to occur in successive child-births; and that in spite of hemorrhage, or of artificial blood-letting; for neither of these is absolutely, and at all times, adequate, either to the prevention or cure of inflammation.

With respect to the other symptoms referred by the author to loss of blood, namely, "mania, coma, amaurosis, deafness, and paralysis"—these are merely the remote effects of the preceding inflammation in the brain, and in no way attributable to mere loss of blood.

I have dwelt thus upon the points in question, on account of what I conceive to be their injurious tendency in regard to practice. If loss of blood be really capable, as here supposed, of producing the effects mentioned, we might well hesitate to employ the lancet in such cases, however strong the indications for the use of it apparently might be; naturally enough considering, that what is capable of producing such symptoms, would not be likely to relieve them.

But although it be true that many of the objections made to blood-letting are without foundation, still you must ever bear in mind that it is an agent quite as capable of doing harm as good, and that the most injurious consequences may result from an excessive or intemperate use of this remedy. Syncope, convulsions, and death itself, are the well-known and immediate effect of loss of blood, when carried to a certain extent; while general debility, with an imperfect, and often irregular performance of some or all of the functions, are the equally well-known remote consequences, if the patient survive. Altogether, they afford a powerful reason against all unnecessary waste of the vital fluid, although they furnish no argument against the judicious, or even the most liberal employment of it, in violent and dangerous forms of disease that are of a nature to call for such a remedy; for the life of the patient may depend (as indeed it often does) upon an unhesitating application of this frequently-indispensable means of cure.

I shall next treat of the application of blood-letting to diseases individually.

## LECTURE VII.

### ON THE USE OF BLOOD-LETTING AS APPLICABLE TO DIFFERENT DISEASES.

Having pointed out, as well as I could, the general effects of blood-letting as a remedial agent, it remains for me to show its application to diseases of different denominations; and here I must recal your attention to what I before stated, namely, that there are few diseases in which, on certain occasions, this remedy may not be had recourse to with more or less advantage. As, however, it is not equally adapted to all, nor even to the same disease at different times, and under different circumstances, it becomes necessary to speak of it more in detail, for the purpose of pointing out the various circumstances which are to guide us in the use of this powerful, though far from universal means of cure. To know and to understand these thoroughly, and to be able to apply them justly, constitutes in fact the true art of physic, and is the only real test of practical skill.

Among the diseases to which blood-letting is particularly adapted, inflammation undoubtedly claims the first place, for it is here that the power of the remedy is most strikingly displayed, and its employment the most frequently called for. But even here the exceptions and qualifications are so numerous, as to require particular attention. Inflammation is a subject of the widest range, and involves in its consideration that of most other diseases. There are very few, indeed, and these of comparatively small importance, that either do not consist absolutely in inflammation, or which are not consequences, more or less remote, of this affection. To be convinced of this, you need only look attentively at the list of diseases furnished by writers on methodical nosology. In doing this, however, you must be careful not to be misled by names; for these seldom give us any information in regard to the real nature of the disease spoken of. You must also disregard what are merely symptoms, for in numerous instances these have been ranked as distinct species of disease. When I mention the terms hydrocephalus, hydrothorax, anasarca, gout, rheumatism, catarrh, diarrhœa, dysentery, &c. (all of which consist in inflammation of different structures, though the names do not at all imply this), you will readily see the grounds for the assertion just made.

In order to the better understanding the use of blood-letting in the treatment of inflammation, it is desirable to inquire a little into the nature and consequences of this disease; for it is a subject about which widely-different, and even opposite, opinions still prevail among practitioners. It is often asked, "What is inflammation? In what does it essentially consist?" These are questions to which, I fear, no very satisfactory answer can be given. We know it only by its effects, and by comparison with the healthy state. It is even difficult to give a strict definition of the term, that is, to give in the compass of a few words such a character of the disease as will enable us at all times to recognize its presence. Some of the characters of inflammation are obvious and striking, so as not easily to be mistaken; they have accordingly been noticed from the earliest times. Such, for example, are the cardinal signs "redness," "heat," "pain," and "swelling." Wherever these co-exist, we may be sure that inflammation is present. As, however, any one of them, and even more than one, may exist without inflammation; and as such signs are not always open to observation (as where the disease is situated internally), it becomes necessary to resort to other means of ascertaining the existence of the disease. The most satisfactory are, perhaps, the local signs of hardness and tenderness on pressure (supposing the part to be within the reach of manual examination), with impeded or disordered function; and, above all, if present, a febrile state of system (*pyrexia*), indicated chiefly by heat of skin, furred tongue, and thirst—symptoms which, alone and of themselves, always serve to show the existence of inflammation. With due attention to these different signs, there will be little risk of overlooking the disease, wherever seated.

The intrinsic nature of inflammation (by which is to be understood the physiological condition of the inflamed part) is a point about which opinions are as unsettled at present as at any former period. Indeed, the most opposite views appear to be entertained on the subject; and certainly not without detriment to practice, which can hardly fail to be more or less influenced by them.

One party, I believe a large one, at the head of which stands the late John Hunter, maintain that inflammation consists in, or, at all events, is always accompanied by, increased vascular action in the part. This is supposed to be proved by the more forcible and rapid movement of the blood through the part, as shown by the enlargement of the veins coming out of it, and the more rapid flow of blood from them when punctured, as well as by the increased pulsation of the arteries leading to and entering the part; and if to this be added the enlargement or new growth of the solids, and the production of new fluids from it, in the way of secretion, together with the increase of sensibility and of irritability which so generally characterize inflammation, wherever seated, it seems difficult to question the increased vitality and activity of an inflamed part.

There are those, however, and not a few, who espouse the opposite opinion, contending that, although it cannot be denied that the larger arteries going to an inflamed part are acting with preternatural violence, the capillaries are in a debilitated state, and the circulation through them retarded.* There are others, again, who take, as it were, a middle course between the two extremes, and maintain that, in the first stage of inflammation, the capillaries, as well the arterial trunks from which they are derived, are in a state of increased action, thus giving rise to the increased circulation observable in and about the part; but that, in the further progress of the disease, the vital contractility of the capillaries is exhausted, and the circulation through them in consequence retarded, or altogether stagnant.

To me, I confess the opinion of Mr. Hunter, viz. that in inflammation there is always an increased action of vessels, appears the most consistent with the obvious phenomena of the disease, as pointed out above. The contrary opinion, however, pretends to be founded on demonstration; and the microscope is appealed to in support of the fact; the web of the frog's foot, and the mesentery of the rabbit, in an inflamed state, having been made the subjects of examination, when the red particles of the blood are seen, it is said, to be retarded in their course, and sometimes even stagnant.

I hardly need remark how fallacious are all conclusions drawn from the microscope alone. Different observers see different things. One of these, Kaltenbrenner, asserts that he saw, in the mesentery of a rabbit that was submitted to the microscope, globules of blood bursting through the sides of a vessel, and forcing a passage for themselves through the cellular tissue into another vessel; thus forming new canals, through which the circulation was kept up! In fact, when you consider the nature of the subjects submitted to observation in these experiments, the minuteness and transparency of some parts and the opacity of others; added to the natural imperfection of the instrument, and the different faculties of different observers; it is not easy to place implicit confidence in such reports, however faithfully made, especially when opposed to the more obvious facts above stated.

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* This notion, as observed by Mr. Morgan, of Aberdeen, in his First Principles of Surgery, &c., was first published by Berlinghierri, of Pisa, as long ago as 1765, though it has of late been given out as a new doctrine.

But although it be admitted that the vital activity of an inflamed part greatly exceeds that of health, it is not simply an increase of the natural action of the part that is taking place, but one of a morbid or preternatural kind; producing, as might be expected, preternatural results. The structure, as changed by inflammation, is different from healthy structure; the feelings and actions of the part are all of a morbid kind; and the fluids formed by it, in the way of secretion, are likewise morbid. So far we may go with safety; but of the precise or intrinsic nature of the action which constitutes inflammation, and which gives rise to such surprising changes, we are wholly ignorant. And the consequence of our ignorance is, that we cannot treat the disease theoretically—that is, in accordance with the presumed nature of the disease—but rather empirically, being guided almost wholly by the light of experience and observation. We are not, for example, on the one hand, to stimulate or excite either the inflamed part itself or the general system, with the view of obviating the debility supposed to constitute the proximate cause of the disease; nor, on the other hand, are we to use blood-letting, or other debilitating means, for the simple purpose of lessening the violence of action. Yet both stimulants and blood-letting are highly useful at times, in the treatment of inflammation, each according to its appropriate circumstances; as I shall endeavour to show you hereafter.

But although so little appears to be known of the intrinsic nature of inflammatory action, we are nevertheless sufficiently acquainted with some of its most important characters, as well as the laws which regulate its course, as to be able to deduce from them practical inferences of considerable value.

In the first place, then, I may observe, with regard to the progress of the disease, that inflammation is seldom stationary; it is almost always either increasing or diminishing in violence, as it proceeds. In most cases it sets out mildly, so as often to escape notice for a time—becomes more and more strongly marked as it proceeds, till it arrives at a certain point, when it begins to decline; and so continues to do, till it wholly terminates. This course it pursues spontaneously, without the aid of art, and even sometimes in opposition to it—that is, where the treatment altogether is not the most judicious.

A great number of cases of inflammation might thus be safely left to pursue their course; nothing more being necessary than removing, if possible, the exciting cause, and avoiding every thing that is likely to aggravate the disease; and indeed, a large share of ordinary medical practice is, or should be, so conducted. But as we are seldom able to estimate justly the degree of disposition actually present—in other words, the tendency there may be in the disease to subside in any particular case, prudence obliges us, as the safer course, where important organs are concerned, to have recourse to active treatment, though it may be productive of present inconvenience to the patient.

The disposition of inflammation to subside of itself is, however, neither universal nor equal, but differs greatly in different cases. There are some inflammations that have little or no tendency to go off of themselves, yet will yield to artificial means of cure. Such is the case with some of those termed *specific*, of which the venereal is an example. There are others again, that neither cease spontaneously, nor are capable of being removed by art; as in the instance of carcinoma.

The disposition varies greatly also in different constitutions; so that the same disease proves more difficult of cure in some individuals than in others; and as the difference can seldom be ascertained before hand, we are never certain of success.

The time required for inflammation to run its natural course depends, in some measure, upon the violence of the disease. The more acute it is, the more rapidly, in general, it goes through its different stages. More appears to depend, however, upon the nature of the organ affected. Compare together, for example, the progress of inflammation in the lungs, with that of ligamentous inflammation in the form of acute rheumatism, and the difference you will perceive to be very striking: the former often running its course to complete disorganization within the space of a few days, while the other continues with violence for many weeks, and at length subsides without injury to the structure of the part affected.

There is considerable regularity observable in the periods of duration in inflammation, varying, however, in different organs. This has been most noticed in the case of *idiopathic* fever (so called) (cerebral inflammation); but the same tendency to observe certain periods was taken notice of by the ancients* with regard to other inflammations, and might be more clearly seen in the present day, but for our constant use of herculean remedies, by which the natural course of disease is disturbed, and often interrupted. You will find it of some advantage to become acquainted with the natural course and duration of different inflammations, as you will be thereby enabled to form a more correct prognosis, with regard to the probable termination of the disease, than is otherwise possible.

Another most important character of inflammation is its constant tendency to change the structure of the part affected, altering, at the same time, both its physical and vital properties. It is, in fact, essentially a disorganizing process, and is probably the primary cause of all morbid changes of structure. Hence the danger of continued inflammation, however mild, in organs, the functions of which are essential to life; and consequently the necessity for suppressing it as early as possible, before it goes to such a length.

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* This may be seen by reference to the writing of Hippocrates, who, as a general rule, limits the use of blood-letting in inflammation of the lungs to the fourth day, the period of crudity; and he cites, as extraordinary, the case of Axonion, whom he bled as late as on the eighth day (the day when the crisis usually takes place). The crisis, or termination, in this case, did not take place till the twenty-fourth day, and then by expectoration, sweat, and urine.

In the application of blood-letting to the cure of inflammation generally, we shall have to attend more especially to the following points:—The degree of the disease; the stage of it; the part or structure which it occupies; and the kind or nature of the inflammation, as *specific* or otherwise; for all these have a material influence on the employment of the remedy.

## LECTURE VIII.

### ON THE USE OF BLOOD-LETTING AS A REMEDY FOR INFLAMMATION IN GENERAL.

Inflammation and the employment of blood-letting are often so strongly associated in the minds of practitioners, that the presence of the one is apt immediately to suggest the idea of a necessity for the other. From the same cause it is, that in diseases the nature of which is obscure and questionable, it has been sometimes argued that the disease was not inflammation, merely because it did not yield to blood-letting—as if this were a universal remedy for inflammation, and applicable at all times and on all occasions. Instead of this being the case, however, I must repeat to you that there are a great number of inflammations which blood-letting will not cure; many also in which, though useful, it may be safely and properly dispensed with; and not a few in which it proves injurious rather than beneficial. In no case, indeed, is blood-letting a certain remedy for inflammation; nor, where it really proves successful, does it appear to act directly upon the disease, but rather by a kind of counter-impression on the system, by which the disease is influenced in a secondary way, as before observed. Were we to suppose it a certain remedy for inflammation in any case, and possessed of directly-curative powers, we might be often led to employ it to an injurious extent, as is now sometimes done in apoplectic seizures, where blood is often drawn to an enormous amount, as if it were only required to carry the evacuation far enough, in order to ensure success.

Different circumstances appear to influence the result, in the application of blood-letting as a remedy for inflammation, and which therefore require to be considered. The following are the chief:—

1. The degree of the disease.

2. The stage of it.
3. The part in which it is seated; and
4. The nature of the inflammation itself.

1. *Cæteris paribus*, the more violent the disease, the greater would seem to be the call for blood-letting, as the most likely means of averting present danger. Acute inflammation, doubtless, requires greater promptitude and activity in the use of remedies, than when the disease is of a milder character, or of a chronic form. But though it be apparently, or even really mild, the disease, when it happens to be seated in organs of importance to life, is not to be lightly treated on that account; for its tendency and power to injure the structure of the part still exist, and must not be disregarded. In parts, too, which naturally possess but little sensibility, such as the lungs, it is not always easy to judge of the real violence of the disease present. If the inflammation be of limited extent, it may be really violent, so as quickly to disorganize the part, without giving much pain, and without materially impeding the function of respiration. The same reasoning applies to the brain, the texture of which is often found partially destroyed by inflammation, the existence of which was not even suspected during life.

2. The *stage* of the disease is of still greater moment in determining both the employment of blood-letting, and the extent to which it is proper to carry it. Generally speaking, the earlier the remedy is resorted to, the safer and more effectual it will be found. A single bleeding, employed on the first or second day of an inflammation, will often put an immediate stop to it; whereas, if delayed to a later period, the remedy is not only less certain in its effect, but often requires to be repeated, possibly for many times, before the object can be accomplished. This is, perhaps, to be accounted for by the change that has taken place in the structure and living powers of the part, a change that is always progressive, and hourly increasing as the disease proceeds.

Another circumstance regarding the stage of inflammation, merits notice: namely, that the quantity of blood required to be drawn in order to afford relief, lessens as the disease advances; so that where a pound or more of blood may be safely and properly drawn in the first days of any inflammation, the quantity of a few ounces comes at length to be sufficient, when the same disease has reached the second or third week. And the same is the case where, either from error or neglect, no blood has been drawn at the commencement. This is to be ascribed, probably, to the increasing weakness induced by the disease, owing, in part, to the interruption or disorder of the natural functions, and partly to the excess of action that is taking place in those cases by which the vital power is exhausted.

3. The organ or part affected in inflammation, has also an influence on the use of blood-letting, and that so considerable as to demand particular notice. Every part seems to possess peculiarities in this respect. *Thoracic* inflammation, for example, appears to be

more under the influence of blood-letting than any other. It seldom fails to cure here, if promptly and actively administered; and further, it may be safely and usefully resorted to at almost any period of the disease; due regard, of course, being had to quantity and the other circumstances before pointed out. Whereas, in the case of *ligamentous* inflammation (acute rheumatism more especially), blood-letting, though often urgently called for by all the signs usually considered as requiring the use of this remedy, fails, nevertheless, in numerous instances, to produce the desired effect. Other organs appear to hold an intermediate station in this respect, between the two extremes. Thus erysipelas, or inflammation on the skin, is less benefited by blood-letting than the active state of the disease would lead one to expect. So also, in the case of what is called idiopathic fever, where the brain is the suffering organ, blood-letting is very generally safe, and often decidedly curative, provided it be employed at the outset of the disease; as within a day or two of the attack. But the same remedy becomes less and less effectual as the disease advances, and at length is decidedly prejudicial.

4th. The *nature* of the inflammation present has an important influence on the use of blood-letting; as we see in the case of those termed *specific*, such as the variolous, morbilous, scrofulous, venereal, and others; all of which, though possessing the ordinary characters of inflammation, stand on peculiar ground in respect to treatment. Blood-letting has no power of curing these, though it may be occasionally useful as a palliative measure.

So that, upon the whole, you see that blood-letting is not to be considered in the light of a general remedy for inflammation, nor to be used indiscriminately; but requires that attention should be paid to a variety of circumstances, without which its employment may be both useless and dangerous.

In the application of blood-letting as a remedy for inflammation, it is by no means necessary, under ordinary circumstances, to use it in a manner, or to such an extent, as to produce any immediate or striking effect, either on the general system or on the disease itself. Upon the abstraction of a moderate quantity of blood, as, for example, ten or twelve ounces, (which experience has proved to be fully adequate to the purpose on numerous occasions,) the disease often begins to decline, though gradually and imperceptibly; and at length goes off altogether, without the production of any sensible disorder, or inconvenience of any kind. It is only in cases of great urgency, therefore, and where parts of immediate importance to life are concerned, that it is either necessary or proper to induce syncope, or even an approach to it.

### *Of the repeated Use of Blood-letting in the Treatment of Inflammation.*

Many cases of inflammation will yield to a single bleeding.

But in order to this taking place, it is generally requisite to bleed very early in the disease, and with as much freedom as the circumstances warrant. If the operation be delayed but a few days, the probability is that a repetition of the operation will be necessary. Some inflammations are so violent, and so indisposed to yield, that a repetition of blood-letting is indispensable, and that for several times. In these cases, when the inflammation is seated in an organ of great importance to life, the intervals should be short, not exceeding six or eight hours. In less urgent cases, a day or more may often be allowed to intervene. The full effect of any bleeding may not take place for many hours, and therefore it is not requisite (unless in very urgent cases) to repeat the operation the same day.

Many chronic inflammations of the lungs, heart, brain, &c., though of long standing, will yield to small and repeated bleedings. In such cases the quantity of blood drawn at one time should seldom exceed five or six ounces, with intervals of a week or more; and if the patient be inclined and allowed to take ordinary food, according to the appetite, the general strength will be preserved; so that the treatment may thus be borne for a great length of time.

The appearance of the blood drawn has often been relied upon as showing the propriety of further bleeding, or the contrary. But this, as a general rule, is very equivocal. The blood first drawn, provided it be taken very early in the disease, will often exhibit no inflammatory character, even where the inflammation is violent, while the subsequent bleedings will be strongly marked in this respect. And, indeed, in all such cases we are to be guided rather by symptoms, and the general condition of the patient, than merely by the appearance of the blood.

A buffy or sizy appearance of the blood is only a proof that the inflammation is going on; but it is not always a reason for further bleeding.

The blood will often present the appearance mentioned in the highest degree, where the strength is so much reduced as not to allow of further loss of blood. This is seen at the latest period of phthisis, and when life is almost extinct; on the other hand a loose state of the coagulum (the opposite of the former), and also a great excess of the serous portion, are neither of them always sufficient to prohibit blood-letting, as where the inflammation is proceeding with violence, and threatening danger to life. Such states of the blood, however, always render great reserve and caution necessary in regard to the quantity of blood to be taken away.

There is a period, no doubt, when it becomes necessary to desist from further loss of blood on account of the weakness of the patient, although the disease may not have given way. It is not easy, however, to define this point with any exactness. Faintness is not of itself a sufficient guide, for this is often temporary, going off entirely after a short time, especially if the patient be put into the horizontal posture. The pulse upon the whole, perhaps, affords the best guide on these occasions. If the pulse continues small and feeble, it will hardly be justifiable to carry the bleeding farther, and we must resort of necessity to such other means as may present themselves.

I have only further to remark here, that it is by no means necessary, generally speaking, to continue to draw blood from day to day till the disease is entirely gone off; it is sufficient, in most cases, to have checked the progress of the disease, so as to put it on the declining side; for, provided no cause of aggravation be applied, it will then gradually and wholly subside. Should it, however, prove otherwise, the disease beginning again to advance, or even if it remain stationary, an immediate recurrence must be again had to the remedy.

### *Of Auxiliaries to, and Substitutes for, Blood-letting in the Treatment of Inflammation.*

In regard to substitutes for blood-letting in general, in the treatment of inflammation, I wish to observe that there are few possessed of much importance, or which can be trusted to in dangerous forms of the disease. Still the practice of blood-letting is always to be considered as objectionable in itself, and only to be justified on the plea of necessity. This necessity, however, is of very frequent occurrence, because it is seldom that a substitute can be found that is at once sufficiently safe and effectual. The evils that may ensue from an intemperate or injudicious use of it are not to be taken into account as furnishing any real objection to the practice; for these, we must presume, are not necessary consequences of it.

The substitutes for blood-letting may be almost all comprised under the heads of *regimen* and *counter-irritation;* and these are also the best auxiliaries. The former includes whatever regards food and clothing—air, exercise, and rest, both of body and mind—sleep and watching,—all, in short, which the ancients designated by the term non-naturals—a strange expression, considering that there is no one of the articles mentioned that is not consonant with our natural wants, and which is not, indeed, in constant and universal use. Attention to regimen, in the enlarged sense of the term is no doubt of considerable importance, whether as auxiliary to blood-letting in the treatment of inflammation, or as a substitute for it on certain occasions. Without such attention the good effects of blood-letting, or other active remedies, may be altogether frustrated. The article of food, however, is by no means the most important part of what comes under the general name of regimen. In most cases, indeed, the laying down any very positive rules on the subject is superfluous; the appetite, when not vitiated by habitual indulgence, or stimulated by variety, being a sufficient guide. In acute diseases, in which the taking food might be injurious, there is rarely much desire for it, but, more commonly, a loathing of it; and in those of a milder or chronic form, a desire for food of a simple and ordinary kind may generally be indulged with impunity. Many instances, no doubt, are recorded of the relief, or even the entire removal, of chronic inflammation of various kinds, by a diet restricted to the simplest articles of food. Pulmonary consumption, for example, if any credit is to be given to medical testimony, has been in many instances cured by a milk diet; and I have myself, more than once, witnessed the great advantage derived from the avoidance of animal food in chronic inflammations, especially schirrus or cancer, as inculcated by my much respected and able colleague, Dr. Lambe. But I speak of abstinence here in relation to blood-letting chiefly, either as an auxiliary or as a substitute for this powerful remedy.

It is thought by many, that the withholding of food altogether is a matter of vital importance in the treatment of active inflammation, and that there is an inconsistency in allowing food to be taken where blood-letting is called for; as if abstinence and blood-letting were, as remedies, identical in their nature. Accordingly, one often sees a patient strictly enjoined to take only water, or at best a little thin gruel, and this to a very limited extent, for days together. All this, however, appears to me without foundation, resting on an assumption that is far from just. The notion is, that as abstinence and blood-letting both induce weakness, they are similar or identical in operation, and, on that account, fit and adequate substitutes for one another.

There is here, however, as I conceive, much misapprehension. It is assumed that blood-letting, in the cure of inflammation, effects its purpose simply by weakening the system; but this I have before shown you is far from being the case. The single circumstance that the curative power of the remedy often depends as much, or even more, upon the manner of drawing, than upon the quantity of blood drawn, is decisive against such an opinion. The comparative effect of these two agents on the general system are exceedingly different. Privation of food, where the appetite calls for it, occasions much disorder in the system at large, as well as great emaciation after a time; whereas the operation of blood-letting, when confined within moderate limits, is exerted chiefly on the sanguiferous system; and, if slowly and quietly practised, may weaken in some degree, but occasions no general disturbance in the system. Instead of this it is often found to communicate fresh vigour to the organs of nutrition; exciting the appetite, and improving digestion; so that the body, instead of becoming emaciated, acquires an increase of bulk.

But even allowing that abstinence and blood-letting act in a similar way, the cure of inflammation, when violent, cannot safely be trusted to abstinence, however rigorous. This is by far too slow in operation to be relied upon in such cases; the disease will have made too great progress to be afterwards arrested, before the remedy begins to take affect.

Upon the whole, admitting, as must be done, that attention to diet is generally proper on these occasions, no uniform rule on the subject can be laid down. In acute diseases, and in the early stage more especially, abstinence, no doubt, is to be inculcated; though generally speaking, such a direction is rendered superfluous by the want of appetite on the part of the patient. But in less active diseases, especially as occurring in weak subjects, and also in the advanced stages of such as are acute, no such restriction is required. Judging from observation, I should say, that blood-letting is not only better borne, but proves more useful, and is more conducive to its purpose—that of inclining the disease to go off—when aided by a proper supply of food; regulated always, of course, by the desire of the patient, and limited to such as is of a mild and ordinary description. The good effect of this depends, probably, upon its equalizing the circulation, which is always disproportionately determined towards the suffering part.

Another branch of the so-called *non-naturalis*, which particularly requires attention, as auxiliary to blood-letting, in the treatment of inflammation, is that which regards rest and exercise. Generally speaking, it is desirable that all exertion, both of mind and body, should be avoided as far as possible. In all diseases of an inflammatory nature, where the circulation is much increased, and which, in consequence, may require blood-letting for their relief, repose is highly necessary; because all exertion tends to accelerate still more the circulation. In inflammation of the heart and lungs, this is of the greatest importance. Upon the same principle, in all brain affections, much attention is to be paid to the sensorial functions. In phrenitis, and in what is called idiopathic fever, for instance, it is highly injurious to make any powerful impressions on the organs of sense, or to exert much the voluntary power; because this cannot be done without a simultaneous exertion of the brain itself—or to employ actively the powers of the mind; and that for a similar reason. Inattention to these points is a frequent cause of the fatality of fevers, where they might otherwise have terminated favourably.

### *Of Counter-Irritation as a Substitute for Bood-letting in the Treatment of Inflammation.*

The principle of *counter-irritation* is of so extensive a nature, as to include almost all our most effective medicinal agents. Even blood-letting, as I formerly remarked, may be considered as coming within its range. The means of producing counter-irritation are very various. Every thing, in fact, that is capable of making a powerful impression on any part of the frame, may act in this way. Even the mind may be made a medium of thus impressing the body.

The kinds of counter-irritation chiefly relied upon, either as auxiliary to blood-letting or as substitutes for it, are vomiting, purging, sweating, and blistering, or any equivalent operation on the skin. To these may be added the effects produced on the system by antimony and mercury, which may be considered as acting on a similar principle.

For the practice of exhibiting the tartarized antimony in large doses, as a substitute for blood-letting in the treatment of acute inflammation, we are indebted, I believe, to the Italian physicians. It is remarkable of this medicine, that although it usually excites vomiting in the dose of a quarter of a grain, or even less than this, it may be exhibited in doses of several grains, often without any sensible effect. I know not how to explain this apparent anomaly. I have frequently administered this remedy, in the way here alluded to, in the practice of this Dispensary, but have not found it in general an adequate substitute for blood-letting in the cure of acute inflammation; nor should I feel myself justified in relying upon it exclusively in such cases.

The employment of mercury as a substitute for blood-letting requires greater notice. The peculiar and specific power of this remedy over the venereal inflammation, is too well known to dwell upon here. But the use of it has been transferred of late, and with scarcely less confidence, to other inflammations, and to those of the liver more especially. That there is much exaggeration in all this, I have not the least doubt. In the first place, I may remark, that mercury is so frequently used in combination with other means, that the conclusion come to in its favour is often questionable on this ground alone; and I know, from considerable experience, that a cure of those diseases may in general be accomplished by the ordinary antiphlogistic means. Without, however, denying altogether the utility of mercury in the cases mentioned, I am disposed to question its superiority over blood-letting, or other anti-inflammatory remedies; while it must be admitted that the inconveniences, and even injurious consequences, that often result from its too free administration, are of a very serious and distressing kind.

A combination of opium with calomel, was strongly recommended several years ago, by the late Dr. Hamilton, of Lynn, as a remedy capable of superseding nearly altogether the use of the lancet in the most acute inflammatory diseases. The idea is, that these two medical substances mutually influence each other, so as to form a compound with new properties—a *tertium quid*, and that this effects what neither of them singly could accomplish. There seems no great probability in this, if we compare the obvious properties of those two substances together—the one, opium, amongst the quickest acting of drugs—the other, calomel, requiring, as usually administered, many days to produce any marked effect. The operation of opium, one would think, must be at an end long before the mercury commences its operation on the general system. It is, however, altogether a question of experience. I have myself often watched the operation of this combination, and I am bound to state to you that I have not found it an adequate substitute for other and simpler means, while the opium has, in many instances, had the same unpleasant and injurious effects, which this drug is generally allowed to produce, when exhibited singly, in cases of active inflammation.

With regard to counter-irritation in general, however produced, as a substitute for blood-letting, I may observe that, although it forms a useful auxiliary in many cases, and may be frequently relied upon alone in such as are slight, and where blood-letting is, from any cause, objectionable, it is to be considered, upon the whole, as far less effective in the removal of inflammation; and in cases where organs of importance to life are concerned, and where the known tendency of the disease is to disorganization, ought not to be relied upon, to the exclusion of blood-letting.

There is one other remedy which merits notice, as an auxiliary to, rather than as a substitute for, blood-letting, namely, the *digitalis.* The power of this drug to diminish the action of the sanguiferous system, is very remarkable. It abates the frequency of the pulse, in a manner, and to a degree, that I believe no other substance does; and, at the same time, cools the skin, and lessens febrile action altogether; thus seeming to do much that blood-letting itself effects. It is not, however, to be relied upon, in active forms of inflammation, but requires the aid of blood-letting, to which it is rather an auxiliary than a substitute.

### *Of the Use of Blood-letting as a Remedy for the Consequences of Inflammation.*

The consequences of inflammation are sometimes the subject of treatment by blood-letting, as well as the inflammation itself from which they spring. They vary with the part affected, and consist either in a change in the organization of the part, or in an increased and, for the most part, an altered secretion from it. Thus, with respect to the solids, these commonly swell or increase in bulk under inflammation, become indurated in their texture, and incapable of performing perfectly their function, whatever this may be. Further changes take place, according to the degree and duration of the disorganizing process, but which it is not necessary now to dwell upon.

When surfaces are attacked by inflammation, the secretion furnished by them is changed, both in quantity and quality. In internal surfaces that have no communication with the atmosphere; the fluid thus formed in excess, if not again absorbed, accumulates, and thus dropsies are produced; either in the large cavities, as the abdomen, chest, and others, or in the minute interstices of the cellular membrane. Sometimes, instead of fluid thus accumulating in the cavities or interstices mentioned, the inflamed surfaces coming in contact, adhere together by a vital union.

When the surfaces lining the canals or passages of the body (inlets as well as outlets) that communicate with the atmosphere, are attacked by inflammation, the membrane swells or thickens, so as to lessen the diameter of the passage; but the inflamed surfaces have no tendency to grow together as in the former case. If the inflammation be very active, the surface is hot and dry. Soon, however, the secretion returns, and is at first thin, transparent, and acrimonious; but gradually it becomes thicker, opaque, and mild in nature; and after a still further, though uncertain period, the secretion reverts gradually to its natural state. These cases constitute the *profluvia*, or increased discharges, of nosologists, and take the names respectively of coryza, catarrh, diarrhœa, dysentery, &c., according to the particular canal affected.

This swelling or thickening of the membrane, by narrowing the passage, becomes important at times, by impeding more or less the function of the organ to which it leads. Thus, with regard to the nostrils, breathing through these channels becomes difficult or impossible for a time. As, however, there is another channel for the passage of air into the lungs, this is comparatively of little moment. But in the narrower parts of the air tubes, the obstruction to the entrance of air into the chest is sometimes so great as to endanger life itself.

Now to show you the connexion of these affections with the use of blood-letting, I must remark, that as inflammation in all these cases is the primary disease, and as it frequently continues in greater or less degree with the altered condition of parts here described, the removal of the inflammation (supposing it still to be going on) is the primary and most important object of attention. In ordinary cases the inflammation, after running its course, subsides of itself, and requires little if any aid from art. But if, on the contrary, the inflammation lingers on, interference becomes necessary, and blood-letting may in such case be required. The propriety and necessity of this, however, will be determined by all the circumstances that govern the use of this remedy, as before explained. And you are not to be deterred from using it merely because some have said that it is not adapted to inflammation when seated in the mucous membrane; for the contrary is the fact. It is true that blood-letting is not required in ordinary cases of this description, because the discharge itself soon takes off the inflammation; or perhaps it is more correct to say, the return of the discharge is the consequence rather than the cause of the subsidence of the inflammation, and that this takes place spontaneously. But in either way of considering the subject, the utility and propriety of blood-letting is unquestionable. Whenever the inflammation, therefore, proves obstinate, whether under the name of catarrh, diarrhœa, dysentery, or any other, but more especially when it interferes materially with a vital function, such as respiration, the remedy becomes indispensable.

Strictly speaking, blood-letting is not employed for the purpose of removing the consequences of inflammation; whether these consist in enlargement or induration of the solids (tumours), accumu-
ons of fluid in the different cavities or interstices of the body

(dropsies), contraction of canals or passages (strictures, as commonly termed), or increased discharges from the mucous membranes lining those canals (catarrhs, diarrhœas, dysenteries, &c.); but to take off any inflammation that still remains. When this object is fully and satisfactorily attained, opportunity is given for those internal changes in the part, by which the natural structure may be restored. When this happily occurs, swellings disappear, indurations are softened, contractions cease, and preternatural discharges no longer continue. All this is the work of nature, as we express it; and which art no further contributes to, than by removing, where practicable, the original cause of such morbid states.

# LECTURE IX.

## ON THE USE OF BLOOD-LETTING IN DISEASES OF THE ORGANS OF RESPIRATION.

There is no class of diseases in which blood-letting is so frequently called for, or in which, speaking generally, it is so unequivocally useful, as in those of the respiratory organs. These diseases, with very few exceptions, either consist in inflammation, or are consequences of it, as you will soon see. The term *spasm* has indeed been applied to some of them, but in a way the most vague and unsatisfactory. Thus you frequently hear of spasmodic asthma and spasmodic croup—terms by which little more seems intended than that these are states opposed to inflammation; and so far from requiring the use of blood-letting, as to call for remedies of a totally different nature, such as stimulants and narcotics, under the name of anti-spasmodics. The only idea that can be properly attached to the term spasm is that of a preternatural contraction of muscular fibres; but nothing of this kind will be found in regard to many of the affections here alluded to. To what extent, and in what cases, the term spasm is really applicable, will appear as we proceed.

The organs of respiration altogether may be arranged under three heads:—1st, the air-tube (trachea), with its ramifications (the bronchia); 2d, the lungs themselves, with their vessels, nerves, and membranous covering (pleura pulmonalis), together with the cavity in which they are placed (the thorax or chest, as we familiarly call it), and which is lined by an extension of the same membrane that covers the lungs themselves—the pleura; and 3dly, the muscles of respiration, by the action or contraction of which the cavity of the chest is enlarged, and a vacuum formed, which the pressure of the external atmosphere immediately supplies. This constitutes the act of inspiration; while the admitted air, or rather a portion of it, is again expelled, principally by the elasticity of the ribs, aided occasionally, however, by the forcible contraction of the abdominal muscles. The morbid affections of these different parts give rise to a variety of symptoms each peculiar to itself, though subject to be variously combined.

*Dyspnœa*, or difficulty of breathing, is the principal character of these affections, and that which leads to danger. Pain and coughing also frequently attend them, but are subordinate to the former in point of importance, upon the ground that disordered function is always of greater moment than disordered sensation. Thus, with regard to the brain, vertigo or giddiness is a much more alarming symptom than mere headache, however severe.

The first division of the subject, as stated above, includes the air-tube and its ramifications, terminating in what are called the air-cells of the lungs. These passages are lined throughout by a continuous membrane (mucous membrane), a part which is peculiarly liable to attacks of inflammation, partly from its direct exposure to atmospheric changes, and partly from the casual inhalation of noxious or irritating matters. The inflammation is known by the generic name of catarrh, which applies to it in all its varieties, though, according as it is situated in different parts of the tube, it takes specific denominations: as that of coryza, when seated in the nostrils; croup, in the larynx; trachitis or bronchitis, in the great barrel of the trachea and its ramifications; and asthma or dyspnœa, when confined to the minuter branches of the tube and the air-cells of the lungs. The affection altogether, however, is the same in nature, and marked by the same primary or essential symptoms, and which are few and simple. The membrane first swells, and becomes hot and dry, more or less so according to the degree of the inflammation present. This is soon followed by a return of the secretion, which is at first thin, transparent, and acrid; then, as the inflammation proceeds and begins to decline, the mucus becomes glutinous or viscid; and, after a longer time, opaque and friable, when the heat and swelling abate and the membrane returns gradually to its natural state.

The tendency of catarrhal inflammation, in all its varieties, to follow this course, and to terminate spontaneously in health after the lapse of a few days, is commonly so strong as to call for no artificial aid. If, however, it occurs with unusual severity, an antiphlogistic treatment may become necessary, and especially blood-letting, in circumstances otherwise favourable to its use. When the mucous membrane has suffered repeated attacks of inflammation, the membrane often becomes permanently thickened, and acquires at the same time a habit of secreting mucus largely, and of a vitiated quality, and thus permanent dyspnœa is established.

There are some varieties of catarrhal inflammation which require more particular notice. When, for instance, the inflammation is confined to the nasal passages, it is productive, comparatively speaking, of but little inconvenience; but when the inflammation, as is sometimes the case, extends into the frontal sinuses, it gives rise to pain over the forehead, general headache, and sometimes febrile action. These take place with such severity at times as to justify blood-letting to a considerable extent. Sometimes the disease spreads into the Eustachian tubes, which become obstructed by the swelling of their lining membrane, and deafness is the consequence. Deafness, from this cause, however, is seldom permanent.

When the inflammation affects the lining membrane of the larynx (croup), this being a very sensible and irritable part, it gives rise to much coughing, while the swelling of the membrane at this narrow part of the air-tube, impedes the respiration often in a dangerous degree, especially in very young children, in whom the passage is naturally narrow. The muscles attached to this part of the tube, are apt to be irritated from time to time, into spasmodic contraction, which, while it lasts, is productive of great aggravation of symptoms. In this sense only is croup to be considered a spasmodic disease. The inflammation here is often of so active a character, as to throw out coagulable lymph; forming, as it were, a new membrane on the inflamed surface, and which is not detached, perhaps, for several days; during which, the life of the patient is in great danger. There is another source of danger in infants, namely, the tendency of the brain to become disordered; and thus fatal convulsions are apt to ensue.

The danger of croup altogether, is such as to call for active treatment, especially blood-letting, to the utmost extent, that the age and other circumstances of the patient warrant. General bleeding, either from the arm, or (which is still better perhaps) from the jugular vein, where practicable, is doubtless preferable to local. The earlier, too, this is done, the better; indeed its utility appears to turn chiefly upon this point; for after the disease has subsisted for a day or two, blood-letting is likely to be injurious rather than beneficial.

After blood-letting has been employed to the required extent, it will be proper to have recourse to mercury, giving from one to two grains of calomel (*hydrargyri chloridum*) every three or four hours; continuing this, if necessary, for eight-and-forty hours, or thereabouts; by which time the disease will generally either have begun to decline, or have made such progress as to render a fatal termination almost inevitable. In thus recommending calomel, as an auxiliary to blood-letting in the treatment of croup, I am far from considering it, as some have done, in the light of a specific, but rather as supported by the general opinion in its favour; though this, as you know, does not always rest on indubitable proof. I have employed calomel on many occasions to the fullest extent recommended; giving, for example, two grains every hour, for six-and-thirty hours, without any benefit, and indeed without sensible effect of any kind. In many instances, the patient has recovered under this treatment. But I could say the same of various other remedies, of very different and even opposite natures, that have from time to time been in vogue. And it is no less true that the same varying result has been observed where only the most trifling and inert means have been employed. It is natural, therefore, to feel a little sceptical on the subject. The other parts of the treatment usually resorted to in cases of croup, such as vomiting, purging, and blistering, I need not detain you with. I may remark, however, that where the cough in croup is harassing, and almost incessant, as is sometimes the case, an opiate, though not, strictly speaking, a curative, may be of great advantage in allaying this powerful cause of aggravation.

In persons who have suffered frequently from catarrhal inflammation, especially in advanced life, and when the habit is corpulent, the muscles of the larynx are apt to acquire a morbid degree of irritability, so as to be thrown into a state of spasm, when any acrid matter happens to be applied to the glottis; thus threatening absolute suffocation. The swallowing a little cold water, or indeed any other liquid, will generally suffice to give relief in such cases. I need not add, that this is no case for bleeding.

When the inflammation is confined to that portion of the membrane that lines the great barrel of the trachea, or even its primary divisions, the attendant swelling of the membrane does not materially interfere with respiration; the principal inconvenience then experienced being the cough. This, however, is sometimes so violent, as to disturb the vascular action of the brain; even to the degree, at times, of inducing apoplexy, in habits predisposed to this disease. In such cases blood-letting may be required. But when the disease spreads extensively throughout the smaller ramifications of the bronchial tubes, the accompanying swelling of the lining membrane of the tube comes at length to impede materially the function of respiration. A new train of symptoms then arises, producing not only great distress to the patient, but depriving the system of that influence from the atmosphere that is essential to life. The blood does not undergo in the due degree those changes which respiration is intended to effect. This deficiency manifests itself by a livid hue of the skin, feebleness, and sometimes irregularity of pulse, general torpor of feeling and action throughout the system, and cold extremities. Not unfrequently, also, stupor or delirium occurs, and the tongue is covered with a brown fur. The proper treatment of such symptoms is by no means very clear. Though the mischief originates in inflammation, and that often of an active kind, it is far from certain, that in such a state of the general system, blood-letting is always a proper remedy, or even safe, if carried to any extent. You are to recollect what I before stated, that blood-letting is not a certain or direct remedy for inflammation in any case, but that the propriety of employing it is governed by a variety of circumstances, which I then pointed out. The action of the heart and blood-vessels is so much enfeebled in these cases, that the blood is with difficulty transmitted through the lungs. To draw blood, therefore, for the purpose of checking the inflammation, and thereby reducing the swelling, would rather seem to enhance the danger, by further weakening the heart's action. But, on the other hand, to employ stimulants, for the purpose of increasing the circulation, would be likely to aggravate the existing inflammation. In such cases, we ought to proceed with the greatest caution. If the disease be recent, and the habit tolerably strong, it will generally be right to draw blood; but to a very limited extent, such as three or four ounces. If the effect be good, we are encouraged to a repetition of the evacuation after a few hours. By proceeding in this cautious manner, we give the patient the best chance the circumstances will allow of; without adding to the existing danger. In these cases, there is always a propensity to do too much—as by stimulating, blistering, mercurializing, &c., which can hardly, by possibility, be of any material service, though they are very capable of doing harm. The best hope of escape for the patient is, that, under the depressed state of the circulation, the local inflammation may spontaneously subside, and the air-tube, become again pervious. The inhalation of the vapour of vinegar is a remedy from which some good might reasonably be expected in such cases, as tending to promote secretion; and I think experience sanctions its employment.

Inflammation of the pleura, or investing membrane of the lungs and chests, is the most painful, though the least dangerous, form of pulmonic disease, as it does not necessarily interfere much with the respiratory function. It is one also that admits, in most cases, of speedy and decided relief from blood-letting, provided this be employed in an early stage of the disease, and to the requisite extent—a point to be determined by the strength of the individual, and the other circumstances before explained.

When the substance of the lungs is involved in the disease, the case becomes more important, as impeding the breathing, more or less, according to the extent of the inflammation. The severity and danger are judged of by the degree in which respiration suffers, rather than by the pain, which, indeed, is often very trifling. The prompt application of the chief remedy, blood-letting—the only one upon which much reliance can be placed—is here of the greatest moment; and when so applied, and to the proper extent, it rarely fails to be successful. The same observations in regard to other, and auxiliary means, apply here as in the case of catarrh.

Very little attention is due to the tribe of *expectorants*, as they are called, that are in such general use on these occasions. If they have the effect of withdrawing your attention from the principal remedy, they become, indeed, worse than useless.

The organs of respiration are very frequently the seat of chronic inflammation, which in many instances is the result of neglect of the more acute form of the disease. These chronic inflammations differ from the acute, in little more than in degree; and they require, for the most part, a treatment similar in principle; that is, antiphlogistic; modified, of course, by the circumstances of the case. These affections vary much with season and weather; and, when severe, rarely fail to be benefited, by a moderate loss of blood; the good effect of which is not limited to the giving present relief; it further tends to obviate and prevent that alteration of structure in the part, which, when confirmed, commonly continues through life, bringing in its train numerous inconveniences and evils of a more serious kind, which you will readily understand.

I would advert here, as particularly connected with our present subject, to that most frequent and most fatal of maladies—pulmonary consumption. The worst forms of this disease commence by slow, and at first scarcely perceptible, inflammation in the chest. The pulmonary substance, like other parts, becomes indurated in texture; not uniformly, but to a limited extent at first, but which spreads as the disease advances. These indurations present a rounded or knotty appearance, and differ considerably in size, as well as in their internal structure and consistence, according to the degree and stage of the inflammation. These indurations are commonly termed tubercles, a term that is sufficiently descriptive both of their figure and general texture. A great deal of fruitless labour has been bestowed in endeavouring to prove the specific nature of these tubercles; and the wildest speculations have been broached on the subject. It is sufficient to mention the notion of their parasitic nature and origin, an opinion that some have contended for of late. I will not waste your time by combating such phantoms, which, indeed, if adopted, lead to nothing useful.

This tubercular state of the lungs is never found without being preceded and accompanied by signs denoting the presence of inflammation; these at first, however, are often so slight as to be easily overlooked. As the disease advances, the signs, both local and general, of inflammation, are too obvious to be mistaken; while all the consequences of inflammation, abscess, ulceration, adhesion, hemorrhage, &c., gradually follow.

The admission of the connexion and dependence of this state of the lungs upon inflammation, is of great importance with regard to the treatment, more especially with a view to prevention; for although, from the state of the general health in these cases, as well as certain constitutional tendencies, a very active treatment is perhaps never called for, the treatment nevertheless should be conducted in reference to such an origin. Something may require to be done that, upon other views of the disease, would probably be neglected; and some things avoided, that are injurious.

With respect to blood-letting, the principal object of inquiry at present, I have to observe, that by the employment of this remedy when the first signs of inflammation appear, the mischief, in numerous instances, will be arrested in its course, and a fatal malady probably averted. At a later period of the disease, although the chance of recovery is small, still, as far as a cure is attainable, it is more likely to be accomplished by this than by any other means; while it has the further and great advantage of being the best and most effectual palliative of the most distressing symptoms of the disease: it relieves pain; lessens febrile heat, and the sweating consequent upon this; disposes to quiet and refreshing sleep; and restores appetite when lost.

I hardly need repeat, that in the employment of blood-letting for the purpose now stated, care must be taken to apportion the remedy carefully to the existing circumstances of the case. The quantity of blood taken at once should hardly ever exceed six ounces at a time; and, indeed, on many occasions, half this quantity will suffice. This may be repeated, at intervals of a week or two; and if, happily, the stomach be in a condition to take food moderately, and of the kind to which the patient is accustomed, (and, under this restriction, solid animal food is to be preferred,) the plan now indicated may be pursued for an almost indefinite length of time; not only without loss of strength, but with an increase of both flesh and strength; as I have again and again observed. The digitalis, given in minute doses, (six or eight drops of the tincture,) and combined with some simple bitter, forms an exceedingly useful addition to the plan now mentioned.

The remoter consequences of inflammation in the chest requiring notice here, are adhesion of surfaces and preternatural accumulation of serous fluid in the cavity: and to these may be added, *asthma* strictly so called. Suppuration and ulceration in the lungs are rather to be considered as continuations, or advanced stages of the inflammation that constitutes the disease, than as merely consequences or sequelæ of it. They claim, therefore, no particular notice, except it be to observe, that we have no direct power of relieving them. Certain substances in the form of vapour, and some of the gases, have indeed been inhaled in these cases, so as to come into contact with the ulcerated surfaces; but, however natural it is to expect benefit from such means, the trial of them has generally ended in disappointment. Certain drugs, too, have been vaunted from time to time, for example, the *Uva ursi*—the Iceland moss—and a variety of others, as well as excoriating applications to the skin; in order to prove "consumption curable:" but with the same general result. A few years back, a mercurial course was said by an American physician to cure consumption with almost certainty; but in this country, the disease is almost invariably aggravated by such a course. In short, you will find, I believe, upon trial, that nothing really does good in phthisical cases, but means calculated to arrest the progress of the destructive inflammation that constitutes, as it were, the essence of the disease. Such means, if very early resorted to, have a tolerable chance of succeeding; at an advanced stage of the disease, this result is not to be expected. Happily, however, the same means are the best palliatives; and, when used with proper caution, tend to the prolongation of life, as well as the relief of present suffering.

Adhesion of surfaces, after the inflammation which produced it has subsided, is in general a matter of little moment; though it may tend to constrain somewhat the motions of the lungs, when unusual efforts in respiration happen to be made. But it admits of no aid from art.

Serous accumulation in the chest (badly expressed by the term *effusion*), is a variety of dropsy (hydrothorax) that is, I believe, invariably the result of inflammation; though by no means the only effect, for changes of structure, in different degrees, are always found to accompany the disease. In almost every instance of hydrothorax, likewise, inflammation continues along with the accumulation; as is known by pain in the chest, the small, hard, and accelerated pulse, heat of skin, and, above all, by the coated state of the tongue. In these cases, the removal of the still-existing inflammation is the chief object to be looked to, and this is effected, as far as it is capable of being so, by occasional small bleedings, which, when not prohibited by the general circumstances of the patient, are as safe as they are often useful. These small bleedings should be assisted by the digitalis, which not only does good by its sedative power, but, in many instances, acts also as a diuretic; its operation in this way being often followed by a rapid absorption of the dropsical fluid. Other diuretics, such as nitre, squill, &c., with or without calomel, appear to be sometimes useful.

It will not be altogether foreign to our purpose, to make a few remarks on *asthma*, strictly so called; for the purpose of showing whether, and in what circumstances, blood-letting is admissible for its relief. In common language, the term asthma is applied to all cases of difficult breathing; but, amongst the faculty, it has been long confined exclusively to cases that recur periodically, or by paroxysms; and the prevailing notion is, that the disease is of a spasmodic nature, and not connected with inflammation; and, of course, not requiring antiphlogistic treatment—blood-letting more especially. Now I shall attempt to show you that the theory here inculcated, as applicable to the disease generally, is not sufficiently established; nor is the practical inference deduced from it, free from exception.

Difficulty of breathing (*dyspnœa*) may arise from various causes affecting the organs of respiration. The most frequent, perhaps, is a preternatural thickening of the membrane lining the air-tube, the consequence of repeated catarrhal inflammation. When the affection recurs periodically, it has been called nervous or spasmodic asthma, implying, of course, that the immediate cause of the paroxysm is spasmodic action of muscles. But no muscular structure is found in the course of the air-tubes, with the exception of the larynx; and it is quite evident, from the manner of breathing in these cases, that the impediment is not seated in that part of the tube. During the paroxysm of asthma, the air passes into and out of the lungs slowly, and with great labour and effort on the part of the muscles both of inspiration and expiration; exactly in the way we should expect from a narrowed state of these passages. Now there is no necessity for supposing the existence of spasm, in order to explain the difficulty of breathing in such cases; it is sufficient to show the way in which the paroxysm may take place, without the aid of such a cause.

In most cases of periodical asthma, the disease may be traced back to catarrhal inflammation, as its source. Repeated attacks of this inflammation induce, at length, a permanent thickening of the membrane affected; and accordingly it is found, I believe with hardly any exceptions, that asthmatic patients breathe with more or less difficulty at all times; and in such a manner as to indicate clearly a narrowing of the canal in the smaller ramifications of the tube. Any additional impediment to breathing, therefore, will cause such an aggravation of symptoms, as to constitute a paroxysm, or asthmatic fit. Thus a fresh attack of inflammation (from taking cold, as we term it,) on the already-diseased and thickened membrane, by producing additional fulness or swelling, renders breathing nearly impossible; leaving no passage scarcely, for the admission of air into the lungs, and requiring the utmost efforts of the muscles of inspiration to expand the chest. This difficulty continues (in other words, the paroxysm lasts) till the swelling of the inflamed membrane subsides; an effect which seldom occurs till a copious secretion of mucus has taken place, when the paroxysm terminates; and this is the case in by far the greater number of instances of the disease.

Other causes of an irritating nature produce a similar effect, by increasing the action of the vessels of the part, and consequent fulness, which, though it may not amount to actual inflammation, has all the effect of this while it lasts. Thus the inhalation of acrid vapours of any kind will bring on a paroxysm of asthma where the predisposition to the disease happens to be unusually strong, though the duration of the paroxysm in such cases is less than where actual inflammation arises; for this has a determined and more protracted course.

Asthma, therefore, in a great proportion of instances, appears to be a catarrhal affection in its origin, while the paroxysms are brought on by temporary causes of vascular excitement, producing fulness and thickening of parts, which continue till the increased vascular action again subsides. The returns of the paroxysms are favoured by predisposition; this predisposition appears to consist in an acquired irritability, the natural and ordinary consequence of previous inflammation. The suddenness of the attack, in many instances, furnishes no valid objection to this theory; for the same thing may be observed in another portion of the membrane, namely, that which lines the nostrils; where, from *taking cold*, or from the application of tobacco, or other irritating causes, these passages become almost instantly obstructed, and are not again pervious till an increased secretion of mucus from the surface reduces the vascular excitement upon which the fulness and consequent obstruction depend; thus affording the strongest analogical proof of the correctness of the theory advanced.

What has been now said applies to by far the greater number of cases of confirmed or periodical asthma, the paroxysms of which are readily explained upon the ground stated, namely, temporary increased arterial action in the bronchial membrane. There is, in fact, no necessity for recurring to spasm in order to account for the phenomena of the disease. It remains to inquire, what is the kind of treatment which such a view of the matter suggests; and more especially whether any, and what advantage is derivable from blood-letting in the different circumstances of the disease. But this must be reserved for our next lecture.

## LECTURE X.

### ON THE TREATMENT OF PERIODICAL ASTHMA.

Before going into particulars on this branch of our subject, it will be desirable to inquire how far the term spasm is really applicable to affections of the respiratory organs; or, in other words, to what extent the respiratory muscles are concerned in certain cases of dyspnœa; for it is to muscular structures only that spasm can be referred.

The only muscles found in the course of the air-tube are those of the larynx; but these, as before observed, have no share in producing genuine asthma. It has been conjectured, indeed, by some —I should not say proved—that the back part of the trachea that is placed between the extremities of the cartilaginous rings, and which has generally been considered as ligamentous merely, is in reality of a fibrous or muscular structure, and, consequently, that spasmodic contraction of these fibres may be a cause of periodical asthma. To this it may be replied, that not only has a muscular structure, as here supposed, not been satisfactorily shown to exist, but contraction of the tube is particularly guarded against by the cartilaginous rings themselves; a structure that is gradually changed into ligamentous, as the tube divides and subdivides. Where, therefore, muscular contractility could serve no useful purpose, as far as we can judge, but where, on the contrary, it could only be exerted to the detriment of the function concerned, it seems unreasonable to infer the existence of spasm at this part, in order to account for the asthmatic paroxysm.

But while I contend for catarrh being the true origin of asthma, I am not disposed to deny altogether the participation, to a certain extent, of the muscles of respiration, or rather I should say of the diaphragm, in producing the phenomena of the disease; whether the intercostal muscles have any share in the matter, we seem to be wholly ignorant.

Now the influence of the diaphragm, when morbidly affected, on respiration, is sufficiently clear, whether we appeal to actual experiment, or to natural phenomena, in proof. The diaphragm is a part possessed of great muscular power, and, though it acts quietly and imperceptibly in health, is yet capable of being convulsively affected, as in hiccup; or of being thrown into a state of fixed spasm, as appears to be the case in tetanus, as indicated by the painful constriction experienced across the body in the course of this muscle. It is liable also to paralysis; as observed in the experiment of tying the phrenic nerves in animals, which puts a stop to respiration, as far as it depends upon the diaphragm. This muscle is likewise under the immediate influence of the brain, so as to be readily disturbed in its actions, not only by mechanical injuries and diseases of this organ, but by mental excitement also. Thus, certain emotions of mind produce convulsive movements of the diaphragm—sobbing, as it is termed. The pain and sense of constriction felt in the course of the diaphragm during severe fits of asthma, lead one to suspect, therefore, that the muscle is in a state of fixed contraction or spasm, similar to what takes place in tetanus; while the laborious efforts that are made, in these cases, to elevate the ribs, seem to show that, in this direction only, can the capacity of the chest at such times be enlarged. The relief that is occasionally, though by no means constantly, experienced from the use of opiates and antispasmodics in these cases, affords some corroboration of the opinion of the spasmodic nature of the paroxysm, to the extent specified. Admitting this, however, the spasm is only to be considered as an accessory symptom, and by no means disproves the general truth of the position I have contended for, namely, that the disease altogether originates in catarrh; in other words, in inflammation of the mucous membrane lining the windpipe and its branches; the symptoms varying according to the particular part of the canal that is the immediate seat of the disease. Thus, stridulous coughing, hoarseness, and, sometimes, an entire loss of voice, sufficiently indicate the larynx (the organ of voice) to be the seat of disease. While cough simply, without difficulty of breathing, and without alteration of the voice, shows the trachea only to be affected.

On the other hand, slow and laborious breathing, with wheezing, such as we observe in the paroxysms of ordinary asthma, shows an impediment, not an entire obstruction, to the entrance of air into the lungs, and which appears to arise from a narrowing of the passages, but which, probably, does not extend to the minuter branches, or their terminations in the air-cells; for the air does, to all appearance, reach the lungs in this case, though slowly, and with great effort on the part of the muscles which elevate the ribs. The manner of breathing, in these cases, might be not unaptly compared with what takes place when an attempt is made to expand a pair of bellows, at the time that the nozzle is nearly closed: the whole weight of the superincumbent atmosphere has to be overcome, before the object can be accomplished.

There is still another variety of this affection, in which respiration is short and frequent, without pain, but attended with an intolerable sense of oppression at the chest, and which, like the former, often assumes a periodical character. In this case the immediate seat of the disease appears to be the smallest branches of the air-tube, and the air-cells themselves, which are in a state of temporary obstruction, so as not to admit of the entrance of the air into them. I quote the following as an example:—

A gentleman, 65 years of age, robust in appearance, and having enjoyed excellent health through life, has for some months past suffered occasional attacks of difficult breathing. These generally come on towards night, and often during his first sleep; when he awakes and is obliged to get out of bed, and to sit up during the remainder of the night. He suffers little or no pain at the time, but an intolerable sense of extreme oppression, so as to make him dread immediate dissolution. Yet, to a by-stander, he does not appear to suffer much. This paroxysm lasts some hours, and subsides gradually, with expectoration. The tongue is coated white; pulse rather frequent, between 90 and 100; not full, but tolerably strong. This variety has been called spasmodic; but with as little reason as the former. It appears to be a catarrhal affection, occupying the air-cells and minuter ramifications of the air-tube, by which the air is, in a great measure, prevented from entering the lungs.

Having convinced myself, by previous trials, of the total inefficiency, nay more, of the bad effect, of what are called antispasmodic remedies, I resorted with confidence to as active an antiphlogistic course as the circumstances of the case would warrant. On several recurrences of the disease, two or three bleedings to the extent of 10 or 12 ounces have sufficed to subdue the inflammation, which has commonly ended by a copious expectoration, as in ordinary cases of pulmonic inflammation. The blood drawn exhibited the usual inflammatory characters.

Having thus given you my reasons for thinking that what is called *spasmodic* asthma is, in most instances, founded originally in inflammation of the mucous membrane, it remains for me to point out what practical advantage is derivable from such a supposition, and especially the benefit, if any, that blood-letting is capable of affording in such cases. Now, to do this with effect, it will be useful to distinguish between the paroxysms and the intervals, just as we do in regard to epilepsy. There is, indeed, a remarkable analogy between asthma and epilepsy, both in the nature and in the treatment of those diseases, the seat of the disease constituting the chief difference between them. The object of treatment in both is two-fold: first, the immediate relief of the paroxysm; and, secondly, to prevent, if possible, its recurrence. The means of accomplishing these objects are nearly the same in both affections.

Upon the supposition that the paroxysm of asthma depends upon a spasmodic contraction of some undefined muscle or muscles, various remedies termed antispasmodic, such as the whole tribe of stimulants and narcotics, have been resorted to. The advantage derived from any of these, however, is so very equivocal, that I am not inclined to dwell upon them. The paroxysms are of limited, though unequal, duration; and, in almost every instance, will subside if left to themselves. You see, therefore, that it is very easy to be deceived in regard to the supposed effect of remedies in such cases. With regard to opiates I would observe, that although in some cases they appear to have afforded relief, I have in a hundred instances heard patients express themselves as injured rather than benefited by their use. They appear to lessen the power of the voluntary muscles, at the very moment when the greatest exertion is required from them, in order to expand the chest; and they have the further great disadvantage of preventing expectoration, and thus of prolonging the paroxysm.

Considering, on the other hand, the disease altogether as originating in inflammation of the mucous membrane, it might be supposed that bleeding would be the most effectual remedy for the relief of the paroxysm, and so undoubtedly it sometimes is. If the disease be recent, the age of the patient not far advanced, and the habit tolerably strong, and if there be reason to believe, from the furred tongue, with other febrile symptoms, that inflammation still exist (which is frequently the case, especially when the disease appears to have originated in *taking cold*), a moderate bleeding is as decidedly useful as in any other inflammation. The immediate relief of the paroxysm is not, however, the sole, nor indeed the chief reason for the use of blood-letting under these circumstances; for the paroxysm will in almost every instance subside of itself after a few hours. The principal advantage derived from this source is, that by taking off the inflammation earlier, and more completely, than would otherwise be the case, the predisposition to a recurrence is prevented or lessened, as this predisposition appears to consist in the morbid irritability of the mucous membrane which inflammatiion is so well calculated to induce.

Other means of relieving the paroxysm of asthma are of no great importance. The producing nausea by antimony or ipecacuanha, or even by an infusion of tobacco, which I have known some patients resort to for the purpose, will sometimes give relief. Ammonia, and also æther, have occasionally been used, and with seeming advantage; but they have often done harm, and are at best equivocal.

The treatment in the intervals of the paroxysms is, as just observed, the most important, the object being to remove or lessen the disposition to recurrence, and which is best accomplished by lessening the irritability of the mucous membrane, as just observed. How far blood-letting may contribute to this, I noticed above. Continued counter-irritation, by blistering and the like, may be of some use; tonics, also, and cold bathing, where no febrile state is present—change of climate, mode of life, and occupation—have all been followed at times by apparent advantage; and it is not uncommon for asthma to cease gradually and wholly as life advances.

I may take this opportunity of adverting to the method of investigating diseases of the thorax by auscultation—that is, by listening attentively to the sounds emitted during respiration; and also by sounding the cavity, by tapping with the ends of the fingers on different parts of the chest. This mode of examination has always been resorted to more or less by physicians; though, from the employment of a load of new terms, invented chiefly by our ingenious neighbours the French, and introduced by some of our own practitioners who have enjoyed the advantages of the Parisian schools, one would be led to suppose that a new region of science had been discovered, not inferior to mesmerism or homœopathy. As a specimen of the new language introduced on the occasion, I may enumerate the following, indicating, it is supposed, as many various conditions of the organs in question. Thus, in the compass of a few pages, you will meet with the following:—"Pectoriloquy, perfect and imperfect"—"bronchophony"—"pneumo-thorax"—"rhonchus"—"crepitation, fine and coarse"—"vocal resonance"—"tinkling echo"—"metallic tinkling"—"amphoric, or bottle-like sound"—"clicking"—"bubbling"—"gurgling"—"snuffling"—"whiffs of a cavernous respiration"—fistular resonance, like that of a pan-pipe or key"—"pectoriloquy, forming a little island of voice"—*cum multis aliis.*

It is hardly necessary to say, with regard to this subject, that exploration of the chest by the ear, as well as by the eye, is a highly useful practice. Every cautious and attentive practitioner will, of course, listen to the sounds emitted during respiration, as well as observe the manner and degree in which the chest is expanded. He will thus ascertain with tolerable precision in what degree the lungs are pervious to air or otherwise, and in what particular part: whether a quantity of mucus lies loose and floating, as it were, in the air-tubes—what is the condition of the larynx, as judged of by the voice—and, by the tone of the cough, whether there is or not a great cavity in the lungs, the result of suppuration or ulceration. These, with many other valuable points of information, may be generally obtained by the unassisted ear; and certainly to the full extent that is required for the purposes of practice. If by the use of the ear-trumpet (or *stethoscope*, as it is less appropriately termed) the object investigated (the sound) is somewhat magnified, it is apt at the same time, as in the case of the telescope or the microscope, to become distorted, or less distinct than before, leading different observers (as, indeed, experience proves) to different and sometimes contradictory conclusions. The information thus acquired, too, supposing it to be correct, comes too late, in general, to be of any practical use. It serves to indicate the consequences of disease rather than disease itself; and that at a period when they are far beyond the power of art to remedy.

The arguments are [illegible]
[illegible]

### *Of the Use of Blood-letting in the Specific Inflammation of the Chest.*

The *specific* inflammations that have their seats in this class of organs are, hooping-cough, measles, and influenza. Now blood-letting, though not in strictness possessed of curative powers in regard to either of these affections, is yet capable of rendering important services in all of them. In hooping-cough the inflammation is confined chiefly to the great barrel of the trachea, the lining membrane of which you will find highly reddened after death. This inflammation has a peculiar, and more or less protracted, course to run, which neither bleeding nor any other remedy, as far as I have observed, is able to arrest. It is to the casual and accompanying circumstances, therefore, that attention is chiefly due. Thus, inflammation frequently arises in the lungs, indicated by difficult respiration and other signs, which continue through the intervals of coughing. This seems to be of the nature of common inflammation, and is as readily relieved by blood-letting, and other ordinary means. On the other hand, the larynx sometimes becomes inflamed during the course of hooping-cough, and requires blood-letting for its relief. The brain, likewise. is apt to suffer from the violence of the cough in very young children; convulsions and actual inflammation of the brain arising. This, indeed, is the greatest danger attending hooping-cough in such subjects. Blood-letting, under the proper circumstances, and to the proper extent, is of essential service on such occasions. And I may add that it is powerful in preventing the occurrence of all these secondary affections, while it contributes to the mildness of the disease altogether.

The "measles" is a disease equally specific in its nature with hooping-cough: but produced by a virus of a different and peculiar kind, and governed by peculiar laws. Though incurable by art, it is nevertheless dependent for much of its mildness of character and ultimate safety upon the application of blood-letting. This disease, when the first febrile action has declined, frequently leaves behind it cough, pain in the chest, and other marks of pulmonic inflammation, which not unfrequently, if neglected, terminate in consumption. Small bleedings, from time to time, with other anti-inflammatory treatment, are of the greatest importance, and should be persevered in as long as any hope of attaining the object exists.

Epidemic catarrh, or *influenza*, may be properly ranked among the specific diseases of the chest, though it is to be considered a compound affection,—a combination of cerebral, with catarrh or pulmonic inflammation. The affection of the brain is manifest, in the head-ache, occasional delirium, restlessness, and great prostration of the voluntary power, which always exists in greater or less degree. In a great proportion of cases, the disease goes through its course so mildly, as to require nothing but time and rest, to ensure safe termination. When, however, either the cerebral or pulmonary symptoms are unusually severe, antiphlogistic measures are required, and blood-letting among the rest; but always to a moderate amount, the object being palliation, not cure. The prostration of strength, attended, as it may be, with a weak and rapid pulse, forms no real objection even to blood-letting, provided it be resorted to very early in the disease, and properly proportioned to the general circumstances of the patient. The effect of the evacuation, so limited, is to produce an immediate abatement of all the symptoms, while the pulse lessens in frequency, and becomes fuller and stronger than before. I venture to state this confidently, from my experience during the late epidemic, as well as in several preceding ones. I hardly need add, I think, that the practice some have pursued, of giving stimulants, on account of the temporary depression that exists, is as unsupported by any just theory, as it is contrary to experience.

### *Of the Use of Blood-letting in Diseases of the Sanguiferous System.*

This system of organs, comprising the heart, arteries, and veins, is, for obvious reasons, in an especial manner under the influence of blood-letting. The actions of these parts are readily weakened, or altogether suspended, by this agent; according to the manner in which it is administered, and the extent to which it is carried.

The sanguiferous system is very frequently in a state of preternatural excitement and disorder, not as a primary affection, but from sympathy with other organs. Inflammation, when either violent or extensive, and wherever seated, has this effect; and thus is produced pyrexia, or symptomatic fever, as before explained to you. This state, although in itself always secondary or symptomatic, may become a cause of inflammation in other organs: of which a striking example is afforded in the case of ligamentous inflammation; as in acute rheumatism, where the general circulation is more excited than in any other disease. During the course of this, inflammation is apt to arise in the brain or lungs, and which constitutes, indeed, the greatest danger of rheumatic fever, as it is called. Such a state of system, also, gives a disposition to hemorrhage. Blood-letting, therefore, by diminishing arterial action and the force of circulation, lessens the tendency to these secondary inflammations. When used for such a purpose, however, it only requires to be carried to a moderate extent; the object being not curative, but merely precautionary.

These organs, the heart and blood-vessels, like all others, are liable to inflammation, and that in all degrees. Inflammation of the heart and its investing membrane, (carditis) is the one with which we are the most familiar. Carditis may take place in all degrees, and under all circumstances; requiring, of course, that the treatment should be accommodated to these. This inflammation is not difficult of detection, if you bear in mind the physiological peculiarities of the organ, and the ordinary effects of inflammation on such a structure: pain or uneasiness in the part affected —a disordered state of its functions—with more or less of constitutional disturbance (pyrexia). Acute carditis is less frequent than the milder forms of the disease. I have seen it brought on by running up hill, and by great muscular exertion of other kinds. The pain in this case is commonly acute, while the irritability of the organ is so much exalted, that it will not bear being distended, but contracts when the smallest quantity of blood is admitted into its cavities. The pulse consequently becomes extremely small and rapid, and generally, though not always, irregular also. In some instances that I have met with, the pulse was so small as to be felt with difficulty. This circumstance may lead to error, unless previously understood, by leading one to suppose that the patient is in a state of extreme weakness, approaching to syncope; we might therefore be deterred from using the lancet, where it could not safely be dispensed with. The existence of pain in the region of the heart, however, and the absence of other signs indicative of general weakness, will in most cases render the thing sufficiently clear. In such cases the pulse expands, and acquires additional strength, from bleeding. A tolerably large dose of opium is useful here, as a means of lessening the irritability of the heart, thereby rendering the pulse less frequent, and fuller and stronger than before. And this may be safely done, provided blood-letting be not neglected.

The heart is still more frequently the subject of slow or chronic inflammation. In many cases the disease is accompanied or preceded by inflammation of the lung on that side. These chronic affections of the heart are marked by the usual symptoms, but less violent than the former. The heart often enlarges under this disease, and may be felt, and even seen, pulsating much beyond its natural limits. On some occasions, the pericardium after death is found adhering to the heart, so as to obliterate the cavity. At other times, there is serous accumulation (*hydrops pericardii*). General anasarca, too, often follows, and which is probably to be attributed to the termination of the thoracic duct becoming involved in the inflammation, and consequently obstructed. The treatment is very simple, and consists chiefly in small bleedings from time to time, aided by the digitalis; and, above all, absolute rest of body and quiet of mind. These cases terminate fatally in a large proportion, on account of the structure having undergone too great a change. I could, however, furnish many examples of cures effected by a long-continued perseverance in this simple mode of treatment.

The affection called by modern writers *Angina Pectoris*, in which a constant feeling of oppression about the heart is experienced, appears to me to be based in slow or chronic inflammation of this organ; for I have always observed it to be accompanied by more or less of a febrile state, especially a coated tongue. The paroxysms, which are brought on by quick motion of all kinds, and even by mental affections, appear to consist in a sudden spasm of the heart, putting a stop, for a time, to the circulation; so that the pulse is not to be felt at the wrist. Mr. John Hunter suffered in this way: and I need not tell you that a very short continuance of this state must end fatally.

The extreme suffering of the patient during the paroxysm, as well as the immediate danger to life, call for the use of the most powerful antispasmodic remedies, such as brandy, ammonia, or ether. These, however, are only palliative, and have no tendency to prevent the recurrence of the fits. You must recollect the dependence of the disease originally upon inflammation, so that if the slightest signs of this remain, which generally is the case, the removal of such is the great object of attention. The best means of accomplishing it are the use of small bleedings, the digitalis, and absolute rest, with tonic remedies: when all febrile action has subsided, I have witnessed several of the milder cases of the disease effectually relieved by this treatment.

We shall next inquire into the utility of blood-letting in the diseases of the nutritive system.

## LECTURE XI.

### OF THE USE OF BLOOD-LETTING IN DISEASES OF THE ORGANS OF NUTRITION.

This set of organs consists of the whole alimentary tube, beginning at the mouth and terminating at the anus. It comprises, consequently, the parts contained within the mouth, the fauces, gullet, stomach, and intestinal canal. There are, besides, various accessory organs—namely, the liver, spleen, and pancreas, with their investing membrane, the peritoneum: which last also furnishes an exterior covering to the stomach and intestines, as well as lines the general cavity of the abdomen, in which the parts just mentioned are inclosed. Those different parts are all liable to inflammation, and are all more or less capable of being benefited by blood-letting: but in different degrees, and with some peculiarities that require notice.

I may first observe, that the alimentary canal, like the air-passages, is lined throughout by a continuous mucous membrane, which, in its diseases, follows a course very similar to catarrh, requiring much the same general treatment. The inflammation takes different names, according to the particular part of the canal in which it is seated. Thus in the mouth it is termed the thrush (*apthæ*)—in the throat or fauces, quinsy (*cynanche* or *angina*)—in the œsophagus and stomach, heartburn or pyrosis—in the small intestines, diarrhœa or flux, on account of the watery stools that attend it—and in the large intestines, dysentery. In all these, the disease is of the same intrinsic nature, in consisting in inflammation of the mucous membrane; yet there are shades of difference between them; and as the difference extends to the treatment, they require to be separately noticed.

Beginning then with the mouth, where the disease is termed apthæ or thrush, I may observe that this is seldom a primary affection, but rather consequent upon some other disease, which then is the chief object of attention. Thus it appears as a symptom of many fevers, and those commonly of a dangerous nature; and at a stage of the fever, also, when blood-letting, even if it should have been proper at the onset (which may or may not have been the case), is hardly to be thought of. The thrush frequently makes its appearance in the last stage of hectic fever, when evacuations of all kinds are unadvisable. In short, generally speaking, apthæ or thrush is not a disease to which blood-letting is adapted. When it arises in infants from the use of improper food, attention to diet is almost the only thing necessary.

When inflammation attacks the mucous membrane of the fauces the case becomes somewhat complicated, by the extension of the disease to the tonsil glands, which often swell so considerably as to impede deglutition, and even respiration at times. The muscles of the pharynx, likewise, becoming involved in the inflammation, much pain is felt when these muscles are put into action.

This disease occurs equally in the strong and in the weak. In the former it is prone to terminate in abscess of the tonsils, and that usually within three or four days. The same thing may occur in persons of weak and irritable habits; but in such, instead of deep-seated abscess, the inflammation is more disposed to end in superficial ulceration of the affected surfaces. In by far the greater number of cases of inflamed fauces (cynanche or angina), blood-letting is not called for; and only, in fact, where the habit is strong and the disease quite recent, that is, within little more than twenty-four hours from the attack. After this period the probability is that the inflammation will proceed to suppuration, which blood-letting, if carried to any great extent, would only retard, but not prevent; hence the sufferings of the patient are likely to be prolonged, while the general health will suffer needlessly afterwards. Should any signs of the inflammation spreading to the larynx present themselves very early in the disease, or should the swelling of the tonsils and neighbouring parts appear to press on the glottis, so as to impede respiration, it becomes the more important to have immediate recourse to bleeding. But, as I mentioned before, if not done very early, it might be rather hurtful than beneficial, by retarding the suppuratory process, which, when bleeding fails, is the only effectual relief to be looked to.

In weak and irritable subjects, and where superficial ulceration, rather than phlegmonous inflammation, takes place, loss of blood can hardly be proper. In such cases, mild tonic remedies, such as the cinchona, are more useful. There is a specific inflammation of these parts, accompanied very generally with an efflorescence on the skin, the scarlet fever, over which art appears to have but little influence in the way of cure. This disease is frequently epidemic, and, in some seasons, is extremely fatal—in others, quite the contrary. There is always more or less of cerebral disorder combined with the inflammation on the skin and fauces. Some have asserted that blood-letting is of great advantage in this disease; but general experience seems to be against this practice. The general conclusion I have myself arrived at, from observation, is, that the disease, being specific, is, strictly speaking, not curable by art: and that a passive treatment, is, upon the whole, the most advantageous—that is keeping the skin cool, and exhibiting only simple saline remedies; or, at most, a few drops of the tincture of digitalis, on account of the great frequency of the pulse: thus giving time for the disease to pass quietly through its different stages. If the pulse is weak and soft, slight tonics, as the cinchona with a dilute mixture of wine and water, appear to be useful.

Inflammation of the mucous membrane of the œsophagus and stomach (*cardialgia*), is, for the most part, the consequence of the use of too stimulant food or drinks, and requires, in general, nothing beyond abstinence and mild aperients for its relief. Should the symptoms be unusually severe, and the habit strong, blood-letting might, no doubt, prove useful. Inflammation of the general substance of the stomach (*gastritis*) when acute, is so full of danger as to warrant a liberal use of blood-letting; but of course, not without proper attention to the various circumstances of the case. The same may be said of intestinal inflammation (*enteritis*). Bleeding is generally indispensable in this case, and requires to be carried to a considerable extent.

With respect to inflammation of the mucous membrane lining the intestinal canal altogether, you may revert to what was stated in regard to inflammation of the mucous membrane in general. It is a disease which may be said generally to cure itself, by the increased secretion that takes place from the inflamed membrane at a certain stage. Should, however, the disease prove unusually violent, and be attended with pain of a continued kind, with febrile symptoms, bleeding is of the most unequivocal advantage. This is intelligible enough, provided you discard from your minds the long-prevailing notion that diarrhœa is a state of weakness—a relaxation of the bowels, as the common expression is. Instead of this, all the vital properties of the part affected in diarrhœa are in a state of preternatural excitement. The sensibility is heightened—the vascular action, and also the muscular, are increased—in short, diarrhœa is a state the very reverse of weakness, as far as the part itself is concerned; it is a state of violent action, though, from interfering with and disturbing the nutritive process, it is quickly productive of general weakness of system. And that the disease (diarrhœa) consists in inflammation is clearly deducible from the phenomena of the disease, as well as the consequences to which it ultimately leads—namely, ulceration and other changes of structure. It requires, therefore, a treatment adapted to inflammation, but modified, of course, by the peculiar circumstances of the case. As the natural cure, or rather termination, of the inflammation is by increased secretion, this ought not to be hastily checked, either by opiates or astringents, but rather left to itself for some hours; after which the remedies just mentioned may be properly resorted to.

The term dysentery (literally, disordered intestines) is applied to this disease when the inflammation is confined chiefly to the large intestines, the colon and rectum. Bleeding is still more necessary here than in the case of diarrhœa, the inflammation being of a more active kind, with a greater tendency to disorganization. The chief peculiarity in the treatment of dysentery, as compared with diarrhœa, is, the greater necessity for the employment of purgatives from time to time, on account of the tendency there is to the lodgment of hardened fæces in this part of the canal.

The organs accessory to the process of nutrition, and which are seated in the abdomen, are the liver, spleen, and pancreas. These parts are all liable to inflammation in different degrees, and may require blood-letting for their relief, according to circumstances that I have repeatedly pointed out. Indeed, I should not think it necessary to dwell longer on the subject, were it not that an extraordinary degree of importance has been attached of late years to the liver and its diseases, as if this organ were the parent of a great number of other affections that used not to be attributed to this cause.

Acute inflammation in the liver, as well as in the spleen and pancreas, is in general readily detected by the seat of pain, and the other ordinary signs of inflammation, accompanied as they generally are by a disordered state of the stomach and other digestive organs. The treatment is also very simple, and should be more or less active according to the state of the patient at the time.

Slow, or chronic inflammation in the liver is much more frequent than the acute, and at the same time more obscure in its symptoms, so as to be readily overlooked; as, indeed, it often is. The pain in the inflamed organ is often trifling, and only to be detected, perhaps, by strong pressure over the part. The disordered condition of the stomach, want of appetite, imperfect digestion, nausea, &c. are the symptoms which exclusively attract the patient's notice. He resorts, therefore, to stimulants of various kinds, and generally with temporary advantage; but no lasting benefit is thus procured. On the contrary, the real disease, the inflammation, is often rendered worse by such means; whereas a simple antiphlogistic treatment, such as a small bleeding or two, with the use of mild cathartics, aided by a rather abstemious diet, in general (provided disorganization has not taken place) soon puts an end to the symptoms, by removing their cause.

My attention was strongly and particularly attracted to this subject a few years back, by the case of a much esteemed friend, a distinguished physician in this town, who had been suffering severely for several weeks from a variety of dyspeptic symptoms—namely, want of appetite, dislike for food, occasional nausea, and inactivity of the intestines, with clay-coloured evacuations; but all without positive pain. There was also a great feeling of languor and depression of spirits. It was much the fashion at that time to talk of a "torpid liver," and "want of bile," in order to account for such symptoms; and to these were the complaints of the patient attributed by his medical friends and advisers. Accordingly, the supposed torpidity of the liver was to be roused by the *blue pill*, which was carried the length of making the mouth sore. And in order, in the meantime, to enable the stomach to do its office, gastric stimulants, such as bitters and spices, were prescribed, together with a moderate portion of wine. The wished-for relief not having followed this mode of treatment, I had occasion to see the patient. Instructed by previous observation of several similar cases, and reflecting attentively upon the nature of the symptoms present, I thought there was ground for suspecting the existence of slow inflammation in the liver, and that this was the probable cause of the symptoms under which the patient was labouring; in fact, that the effect had been mistaken for the cause. It is true there was a want of proper action in the stomach and intestines; while the clay colour of the evacuation showed the absence of bile in that canal. Upon careful inquiry, however, into the feelings of the patient, as well as other circumstances, I came to the conclusion I have mentioned. The pulse at the wrist, as generally happens in these cases, was rather feeble, and not much accelerated; but a sensation of heat was experienced in the region of the liver, and considerable uneasiness felt when strong pressure was made on that part. These circumstances alone furnished no weak reason for suspecting the existence of inflammation; and all doubt of this was removed from my mind, when I observed the tongue to be thickly coated with a yellowish crust; such a state of the tongue being, according to my observation, one of the least equivocal signs of hepatic inflammation. This view of the case being admitted, it was not difficult to explain the leading characters of the disease. The inflamed state of the liver would naturally be attended with a suspension or disorder of the functions of the stomach, so as to give rise to the dyspeptic symptoms; while the hardness and swelling that belong to inflammation would (supposing the disease to be seated in the vicinity of the biliary ducts) necessarily compress these passages, thereby impeding the transit of the bile into the intestines; thus accounting for the colourless state of the evacuations, and the sallow hue of the skin. Nor was it difficult to understand why the treatment by tonics and stimulants should have failed; while there was good ground for hoping that the opposite—namely, an antiphlogistic practice, would be more successful. Accordingly, this was resorted to, and in the simplest way. A moderate blood-letting was advised, to be followed by the use of the mildest purgatives. The blood drawn exhibited, as I had anticipated, unequivocal marks of long-continued inflammation of the liver. The crassamentum was thickly buffed and contracted, and the serum was of an intensely yellow hue, as was the urine, which, as well as the skin, thus betrayed the presence of an unusual quantity of bile in the system. The relief experienced was immediate; and by a continuance of the same simple plan, the symptoms altogether were in no long time removed. On several occasions subsequently the same train of symptoms have appeared, and have always readily yielded to the same simple mode of cure.

This is one of numerous instances of the same description which I could adduce as particularly connected with the present subject. I may here allude to jaundice, for the purpose of observing, that, on numerous occasions, you will find blood-letting a very effectual remedy for this disease, or rather symptom of disease (for it can scarcely be considered otherwise).

Jaundice, which is owing to the absorption of bile into the blood-vessels, and its deposition afterwards on the surfaces and in the interstices of the body, proves two things; first, that the liver is still capable of performing its office of secreting bile; and next, that the bile so secreted is prevented, by some obstructing cause, from passing through the gall-ducts into the duodenum. Now, one cause of the obstruction in these cases is, the presence of a biliary calculus, either in the common duct, or in the hepatic duct, which not only interrupts mechanically the passage of the bile, but also excites spasmodic pain of the most acute kind, and which recurs with more or less frequency, though at no certain periods. Another, and still more common cause of obstruction, is inflammation of the liver itself, or some neighbouring part, and which is so situated as, by the swelling that attends it, to press upon the biliary ducts, and produce an impediment to the passage of the bile; thus occasioning jaundice in the manner mentioned. When the inflammation is violent, it can hardly be either overlooked or mistreated. But when it is of a slow or chronic kind, it is often productive of so little pain as not at all to engage the patient's attention, which is directed solely to the stomach derangement, such as want of appetite, sickness, flatulency, and the like. These are commonly attempted to be relieved by stimulants of various kinds. This treatment gives momentary relief; but, as you will readily conceive, must rather tend to aggravate the real disease, the inflammation, that is the primary source of the mischief. In all cases of jaundice, therefore, you should inquire narrowly into the cause of the obstruction, in order that if it be inflammation (which is really the case in a majority of instances,) a sufficiently active antiphlogistic treatment be pursued. The existence of inflammation, however indolent and inactive, may very generally be ascertained by careful inquiry. Thus, pain or tenderness felt when pressure is made in the epigastric region, or under the ribs on the right side, is alone an adequate sign of existing inflammation; and if to this be added a dry and coated tongue, there will really be nothing to doubt of. In the indolent form of the disease here described, the general vascular system is seldom much excited. On the contrary, the pulse is often low, and the feelings of the patient depressed; which is one reason, indeed, why the inflammation is apt to be overlooked, and the proper treatment mistaken. Now this is a case in which blood-letting is often of the greatest service; and, provided the disease be recent, so as to render it probable that the organization of the part has not materially suffered, it rarely fails to yield speedily to this remedy, conjoined, of course, with other antiphlogistic means, and a sufficiently abstemious regimen. You will readily understand, that only a moderate abstraction of blood is required in these indolent cases of inflammation.

For a good many years past—not so many, however, but that I well recollect the introduction of the practice—mercury has been looked up to as a sort of *specific* in these and other chronic affections of the liver; to the exclusion, not only of blood-letting, but of almost all other means. Patients, in consequence, have been doomed, almost without discrimination, to undergo torturing salivations, with a numerous train of other evils. This practice originated among the European faculty in the East Indies, where diseases of the liver are rife, and, as it were, endemic; and it was thence transferred to Europe towards the end of the last century. But, however essential such practice may be in hot climates (of which I can say nothing from my own experience, though I have reason to believe that it is now far less resorted to, even in those climates, than was formerly the case), I am quite satisfied, from frequently repeated observations, that it is not entitled to such considerations in this quarter of the world; on the contrary, that it may, in most instances, be safely and effectually superseded by the most simple antiphlogistic treatment, and that the carrying it to the extent that has been, and still is often done, is productive of much greater evil than any good that it is capable of, will compensate.

In regard to the other parts contained within the cavity of the abdomen, and also those of the pelvis, I have nothing of moment to observe. Inflammation in these parts is accompanied by the usual signs, and blood-letting is applicable to them under the same circumstances, and to the extent those circumstances indicate, just as other inflammations. I may safely remark, however, with respect to some of these organs—the uterus, for example, and the peritoneum altogether, that when affected by inflammation, the pulse is always small and frequent. This state of pulse, therefore, is not of itself a bar to the use of blood-letting, when justified by other signs.

*Of the use of blood-letting in inflammation of ligamentous structures.*—The fibrous, and for the most part, inelastic textures, which come under this denomination, are found eternally throughout the body. The ligaments of joints, the fasciæ or tendinous aponeuroses covering muscles, and the tendons by which these are attached to the parts to be moved, all come under this designation: the periosteum, too, has generally been considered in the same light. All these are very liable to inflammation, both acute and chronic; and rheumatism is the general term applied to inflammation of this particular structure.

Rheumatism, a rather unmeaning term, may be defined "an inflammation of ligamentous structure," and is properly applicable, therefore, wherever such a structure is found in an inflamed state. We are accustomed, however, to limit the term principally to affections of the joints, and the fasciæ or tendinous coverings of the muscles in connexion with them. Now you have here a striking example of the influence of structure, in modifying both the character and consequences of inflammation; and also the effects of remedies, more especially blood-letting, which is found to be far less efficacious in this variety of inflammation than in most others, although the circumstances which are usually considered as demanding the use of this remedy are more strongly marked than in perhaps any other. In no disease is the pain greater, or the febrile symptoms more violent, or the pulse more full and strong, as in many cases of acute rheumatism, or rheumatic fever, as it is termed. But notwithstanding these, and even although the patient be in high health and vigour, and in the prime of life, blood-letting, in a great majority of instances, seems to do little more than palliate; and if carried very far, it appears to have a tendency rather to prolong the disease, by interrupting or retarding that natural course and termination which are common to this with most other inflammations.

The continuance of the inflammation itself seems to wear out, and gradually exhaust, the disposition to the disease in the part; whereas, if put a stop to prematurely, whether by blood-letting, the application of cold, the colchicum, or any other means, the disposition is yet to remain, and the inflammation in consequence likely to be renewed; so that, upon the whole, the duration of the disease is prolonged by such treatment. Large bleeding, also, appears to favour the disposition to *metastasis*, which is one of the greatest dangers attending this disease. But although this is the general character of blood-letting, considered as a remedy for acute rheumatism, it now and then happens that the disease is quickly and effectually removed by an early bleeding or two to a moderate extent; so that in favourable circumstances it is worth while to make the attempt, as, should it fail to cure, it may contribute to mitigate the future violence of the symptoms.

A remarkable contrariety of opinion has prevailed among practitioners with respect to the use of blood-letting in this disease (acute rheumatism). We find Dr. Cullen recommending this remedy, with great freedom, in such cases; whereas Dr. Wells gives it as his opinion, that simple rheumatism, even in its most acute form, does not require bleeding, but is most successfully treated by the cinchona in large doses, a practice that was first introduced by the late Dr. George Fordyce, physician to St. Thomas's Hospital, and which, I believe, is not now wholly obsolete in that establishment.*

The late Dr. Fowler, of York, who took much pains in investigating the effects of different remedies in the treatment of rheumatism, gives us a history of 41 cases of this disease in the acute form, that occurred in the Stafford Infirmary: of these, it appears, three were cured chiefly by blood-letting; seven were much relieved by it; seven only moderately so; and twenty but little relieved; while four appeared to receive no benefit from it. And it deserves notice, that in 37 cases of chronic rheumatism, treated by the same remedy, the result was very nearly the same.† Perhaps the conclusion we ought to come to, amid this diversity of testimony, is, that the cures, after all, are more attributable to nature, as we term it, than to the remedies employed. And this, I am inclined to think, would be a just conclusion.

You have probably heard and read much of rheumatism of the heart: a subject that is worthy of your attention, inasmuch as the use of this language has, I think, sometimes lead to erroneous practice. This expression was first used, I believe, by the late Dr. David Pitcairn, one of the physicians to St. Bartholomew's Hospital, and applied by him to inflammation of the heart, when it happened to arise during the course of acute rheumatism. Dr. Baillie, subsequently, in the 2d edition of his Morbid Anatomy, 1797, took a similar view of the subject. From that time to the present, the same opinion has been pretty generally entertained. As a mere matter of speculation this would be of little moment; but a practical inference has been drawn from it that is of no small importance, namely, that the affection of the heart is itself rheumatic, and therefore requires a corresponding mode of treatment. This opinion appears open to objection; and, if acted upon, to be not without danger. One can see no sufficient analogy of structure here, to warrant the adoption of such an opinion. It seems more reasonable to attribute the inflammation of the heart, as well as that of the lungs, that so often appears in the course of rheumatic fever, to the general disposition to inflammation that prevails throughout the system in this disease. It is not uncommon to hear disorders of the head and chest called rheumatic, merely because symptoms of rheumatism appeared in other parts about the same time, or even long previously. Indeed, it is admitted by Dr. Wells himself, that copious bleeding in the beginning is the proper remedy when the heart becomes affected in acute rheumatism. And I can say the same, from experience, when the lungs exhibit signs of inflammation in this disease.

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* See Transactions of a Society for promoting Medical and Surgical Knowledge, vol. iii. p. 373. Dr. W. goes so far as to say, that "it has been found in London, that bleeding is never required for the cure of acute rheumatism of the external parts, and that it sometimes proves highly injurious."—*Ibid.* 409.

† Medical Reports on Blood-letting, Sudorifics, and Blistering, in Acute and Chronic Rheumatism. By Thos. Fowler, M. D. 1795.

### *Of the Use of Blood-letting in Gout.*

This is a variety of ligamentous inflammation which one would be almost tempted to call specific, on account of the many peculiarities by which it is distinguished. Gout resembles rheumatism, in having its seat in ligamentous structures; yet, unlike this, it is confined, for the most part, to certain joints; as those of the feet first, especially the joint of the great toe, though spreading often to the instep and ankle, and, upon a repetition of the attacks, to the hands; and, occasionally, other joints. It commonly returns at somewhat regular periods, as yearly, or oftener; and when it has frequently recurred the intervals are shortened, and the duration of the fits protracted. But in all this there is much diversity. When the gout has become habitual, and the general health is much broken by its continuance, it is liable to metastasis; violent spasmodic pain taking place in the stomach; at other times, acute headache, &c.; and which are often termed gout in the stomach or head.

The gout rarely makes its appearance before the age of puberty, and, indeed, generally speaking, much later than this; but it seldom appears, for the first time, at an advanced period of life. It rarely attacks females in comparison with males. The tendency to it is often hereditary. It is brought on, in numerous instances, by luxurious living, and is therefore comparatively rare in the labouring classes of society. It would seem to have some connexion with wine-drinking, rather than the use of spirits; for the labouring classes are more addicted to the latter, yet are seldom the subjects of gout. This has led to the further notion that gout is founded in acidity; and accordingly alkalies have been recommended for its cure; but as far as I have seen this practice is of little avail. Earthy deposits (chalk-stones, as they are called) frequently take place about the joints that have suffered repeated attacks of gouty inflammation. These concretions consist of phosphate of lime, and not of chalk, as their appearance might lead one to suppose.

Gout consists in inflammation; but whether this is really of a peculiar or specific nature, is undetermined. The inflammation, however, is so violent in many cases, especially when it takes place in the habits of tolerable vigour, and the febrile symptoms run so high in many cases, with great strength and fulness of pulse, that you will be strongly tempted to have recourse to blood-letting, as promising, under such circumstances, to subdue the inflammation. After many trials, however, of this remedy in such cases, my expectations have been disappointed; and I have been compelled, reluctantly I own, to fall back on the passive mode of treatment, which the experience of the most judicious practitioners in all ages has confirmed as the most safe. I consider blood-letting, therefore, to be merely useful as a palliative in gout; and only necessary or proper where the febrile symptoms happen to be unusually severe.

There is a variety of ligamentous inflammation intermediate, as it were, between gout and rheumatism, and which is commonly designated by the term rheumatic-gout. It affects chiefly the smaller joints, especially those of the fingers. The joints swell, and become gradually rigid and contracted, so as to render the hands in a great measure useless; and there is also much pain experienced. Unlike gout, however, it does not seem to arise out of luxurious living; while it appears to be even more frequent in women than in men. I know of nothing that is deserving of much confidence, as a means of relief, in this distressing affection; for my trials of all the remedies that have been recommended have generally ended in disappointment. I have only to add, that blood-letting appears to be as ineffectual as all the rest.

Our next object will be to consider the use of blood-letting in diseases of the nervous system.

## LECTURE XII.

### OF THE EFFECTS OF BLOOD-LETTING IN DISEASES OF THE NERVOUS SYSTEM.

Under the term *nervous system* are included, 1st, the encephalon, or general contents of the cranium; 2dly, the spinal cord: and 3dly, the different nerves proceeding from the one and the other; with the ganglions attached to and connected with them; and, as appendages to the brain, may be mentioned also the external organs of sense, and the muscles of voluntary motion. But, in reality, there is no part of the body that is not, more or less, under the influence of the nervous system. In pointing out the effects of blood-letting on this class of organs, I shall, however, confine my remarks principally to the encephalon or brain; for of the other parts of this system (the spinal cord and nerves), in relation to this remedy, but little is known from any direct experience; though we may presume they are, equally with other parts, under the influence of this agent.

The pathology of the brain, like that of other organs, can only be properly based on its physiology. The brain, then, considered as a whole, has many peculiarities, both physical and vital, by which it is distinguished from other organs. These peculiarities require to be pointed out, as they modify materially the symptoms and consequences of disease, and, not less so, the operation and effect of remedies. I am aware that much that I shall have to observe on the present occasion has been the subject of former remark; yet I would fain hope its importance, practically considered, will justify the repetition, as enabling you the better to understand, and apply to use, the powerful agent that forms the particular object of our inquiry.

In the first place, then, you will observe that the brain altogether, including the cerebrum, cerebellum, and medulla oblongata, with their membranes and vessels, and the blood contained in these, are confined in an unyielding bony case, that has no direct communication with the atmosphere, and the cavity of which they completely fill. This last fact is proved by the correspondence that is observed between the convolutions or prominences on the surface of the brain, and the depressions or hollows that are seen on the inner surface of the cranium. It is proved, likewise, when the entire head is first frozen, and then sawn through in a vertical direction, when the relative position of every part is distinctly seen, while at the same time you will perceive that there is no vacuity; nor is there any elastic matter present. The next observation to be made, is, that the contents of the cranium, as enumerated above, are all incompressible substances; at least, by any force that can possibly be conceived to be applied to them during life—as much so, in fact, as water itself.

Now the necessary consequence of this state of things is, that the entire quantity of blood in the whole organ (under ordinary circumstances) can neither be increased nor diminished, though it may be very differently distributed at different times. The arteries, for example, may contain more blood at one time that at another, so as to occupy greater space than before; but if this be the case, the veins must contain proportionally less of blood. The same irregularity may take place in different parts of the brain, in respect of each other. There may be, for instance, a greater quantity of blood circulating in one part, owing to an increase of action in the vessels of that part; as when inflammation arises in a particular part of the brain, attended by more or less of swelling, which must necessarily impede the circulation in other parts of the organ: and, doubtless, in such cases the functions will be affected in a corresponding way.

Again, although the quantity of blood in the brain altogether remain the same, the force and rapidity with which it circulates may be greater or less; this depending principally upon the activity of the cerebral vessels themselves, and comparatively but little upon the heart, or general vascular system. This comparative independence of the cerebral upon the general circulation, it is of importance to bear in mind when we are considering the diseases of this organ.

The brain altogether, including the cerebrum, cerebellum, and medulla oblongata, may be considered a double organ, consisting of the two hemispheres, each divisible into a number of corresponding parts, each of which is marked by some peculiarity of figure and position; and doubtless, also, by peculiarity of internal arrangement or structure; by which each is fitted to perform a distinct office, and for which none other, probably, is capable of acting as a substitute. This peculiarity of organization and of office, in the individual parts of the brain, is the true and only foundation of phrenological science. Whether this science is justly entitled to be carried to the extent its advocates suppose, is still, and probably will long remain, a matter of dispute. Without a general admission, however, on the subject—as far, at least, as the more obvious divisions of the brain goes—it is impossible to comprehend a variety of phenomena that present themselves, in regard both to the physioloy and pathology of the brain. It is undisputed that a certain part of the brain is devoted to the sense of vision, another to hearing, a third to smelling; and so on; and we are therefore warranted by analogy in concluding the same with respect to the other portions of the brain, although we are not able, as yet, to afford the same satisfactory proof of the fact.

The circulation of blood in the brain has likewise its peculiarities, as compared with other parts, and which will be found to have a most important influence on its diseases. The arteries going to the brain enter the cranium through narrow bony channels, a circumstance which serves to check the force of circulation in the organ, and guard it against any increased impetus from without. The same end is further attained by the anastomosis of the arteries within the skull, before they enter the substance of the brain. In this way the brain is in a great measure withdrawn from the influence of the general circulation, so that no violence of action on the part of the heart can have much effect on the circulation of the brain; this depending almost solely on the action of its own vessels, the heart doing little more than supplying it with the necessary quantity of blood to enable it to carry on its functions. Accordingly, we often find the brain performing its functions quietly, and in the most orderly way, where the general circulation is in a state of great and violent disorder; as in many cases of acute rheumatism, as well as other inflammations; while, at other times, the different functions of the brain are performed with unusual energy, accompanied with evident signs of high arterial action going on within the skull, where the general circulation is at the time in the feeblest state.

The causes capable of exciting the arterial action of the brain are both numerous and various; and they probably influence the organ unequally in its different parts. Among others may be mentioned impressions made on the different organs of sense: various stimulants that act on the brain through the medium of the stomach, and certain emotions of mind, have all the effect of increasing the circulation, in the brain, as the result of increased arterial action there.

But the most striking example of a stimulus acting on the vascular system of the brain, so as to increase in all degrees the cerebral circulation, with a corresponding influence on the functions, is that afforded by alcohol, which appears to exert a specific operation, as it were, upon the brain and its functions, producing at first a state of simple excitement of the organ, and at length (if carried far) a total suspension of its functions—an apoplectic state, as it might be justly termed. The first effect observed from the use of intoxicating drinks is that of increased arterial action in and about the head; as shown by the greater pulsation of the carotids—the bloated and suffused state of the cheeks and eyes—as well as by the increased heat of the whole head. This increase of arterial action occasions an increased circulation in the internal as well as external parts of the head—in the brain as well as in the neck, face, and scalp. The effect produced upon the cerebral functions during this first stage of increased arterial action is that of excitement simply; the sensorial functions, in general, are performed with greater energy, and with little or no disorder. This is the first stage of intoxication, if, indeed, it deserves the name. A second succeeds, and which is easily explained on the same grounds. As the vascular excitement goes on, the arteries not only continue to act with violence, but also become enlarged in their dimensions; probably because the *vasa vasorum* are equally excited with the arterial trunks to which they are distributed. Then it is that the distended arteries begin to press upon the cerebral veins; and this they may do, although remotely situated from each other; the intermediate substance of the brain being incompressible, will readily transmit the pressure to the most distant part of the organ. The circulation then begins to be impeded, and the function disturbed, a state of wild delirium taking place. This may be considered the second stage of intoxication.

But there is a third stage also, where, from the increasing arterial fulness, the circulation of the organ becomes more and more interrupted, so as at last to put a stop to the exercise of the sensorial functions altogether—a state of perfect apoplexy, differing from other apoplexies only in regard to its exciting cause. The recovery from this last stage of intoxication is easily understood. The increased arterial action subsides after a time, and the arteries resume their former dimensions. The pressure is thereby taken off the veins, and the circulation is restored. There is no necessity to resort here, as is often done, to the nervous system, in order to explain the phenomena, for these are readily understood by reference to the vascular system alone.

The brain performs a variety of functions, some of which are primary or special, while others are less direct. It is, for example, exclusively the source of sensation—of the voluntary power—and of thought. Hence alterations in any or all of those functions imply a corresponding change in the condition of the part of the brain in which those functions are, as it were, lodged. Thus altered vision (the eye or external organ being perfect) implies a change in the optic thalamus, or the optic nerve leading to it; and so of the rest. In like manner, an alteration in the mental faculty implies a corresponding change in that part of the cerebrum, whatever this be, through the agency of which the powers of mind are manifested; so that we chiefly judge of the condition of the brain, in regard to health and disease, by observing the state of the functions which it exercises.

But we have likewise other modes of judging of the soundness or unsoundness of the brain; namely, by the feelings of the part, and by the state of other functions that are known to be dependent on, or intimately connected with it. Such, more particularly, is the stomach, and, in short, all others, though in different degrees. This universal influence of the brain over other organs you will readily see must give rise to a far greater diversity of symptoms than in the case of other organs; and as these symptoms often manifest themselves remotely from the brain itself, although originating there, the affection of the brain is liable to be, as it often is, overlooked.

With respect to the feelings of the part, as serving to point out the existence of disease in the brain, it is important to know that this organ, though the source of feeling to other parts, is yet itself among the most insensible. The most violent and fatal diseases of the brain are often unattended by pain in the head; as is observed in many apoplexies, and in fevers of the worst description, though pain may be felt in a distant part of the body, as cramps in the legs, &c. So, again, disorganization creeps on in the brain, till it at length terminates suddenly and fatally in apoplexy or palsy, without any preceding pain in the head. But although the affections of the brain are characterized by an almost infinite diversity of symptoms, there is no organ more simple in regard to the intrinsic nature of its diseases than the brain itself. The only disease of this organ, in fact, of which we have any certain or distinct knowledge, is inflammation, with its consequences. And it is here, more especially, that the observation I formerly made applies with the greatest force; namely, that almost all diseases either consist in actual inflammation, or are consequences of it, more or less remote. But you will have a very limited and imperfect notion of inflammation of the brain, if you confine the term to phrenitis, as usually defined. This is the least frequent of its forms, and applies only to cases where the mental function is particularly and violently disturbed. But there are innumerable instances of inflammation going on in the brain, and proceeding to a fatal termination, without any disturbance of the mental function from first to last. Without a knowledge of this fact, the disease will be often overlooked, and danger incurred. When inflammation arises in the brain, it may affect the organ generally, so as to disturb all the functions at once, as well as to produce general disorder throughout the system, as is the case in what is termed idiopathic fever. Or the inflammation may be confined to any one or more of the individual structures that altogether constitute the brain as a whole; and the symptoms will vary, according to the particular seat and extent of the inflammation present. This frequent and almost constant connexion of the diseases of the brain with inflammation, as stated above, will naturally lead you to expect that blood-letting must be very frequently required for their relief; and such, undoubtedly, is the case. Yet there is no class of diseases that require greater caution and discrimination in the application of this remedy, than those we are now considering. It is not enough to say that fever, or any other disease, consists essentially in inflammation of the brain, in order to justify the application of blood-letting; for without due regard to various qualifying circumstances, the remedy may become worse than useless. I shall proceed now to speak of its application to different forms of cerebral disease, commencing with those of the most acute description.

### *Of the Use of Blood-letting in Phrenitis.*

The term phrenitis has been applied to inflammation of the brain, when accompanied by active and furious delirium; and it has been supposed that this is a case peculiarly calling for the use of blood-letting. Such a state of mind, however, is not a sufficient justification of the practice: on the contrary, the most furious delirium may take place, where the other circumstances are altogether adverse to the practice. Delirium of this kind, for example, occurs suddenly and unexpectedly in the advanced stage of many fevers, where the corporeal powers are utterly prostrate, and death approaching; when, in fact, blood-letting could but hasten the fatal event. In short, I may tell you once for all, that our indications of cure are not to be drawn, in this or any other case, from the state of mind merely, but from corporeal signs. The most violent delirium is not of itself an indication for bleeding; nor, on the other hand, is the absence of delirium a proof that blood-letting may not be required. You are to look to the general circumstances of the case, the age and habit of the patient, and more especially the stage of the disease, as affording the safest guides. This is still more necessary in regard to the extent to which the remedy is carried, supposing its use to be proper. The bleeding a patient largely, merely because the delirium is violent, is a practice as unreasonable as it is dangerous in its result.

These strictures apply with equal force to the employment of other means, where the violence of the delirium seems to be taken as the only measure in the administration of remedies. Thus, because the patient raves, and does not sleep, opium is often exhibited to a dangerous extent; as if the procurement of sleep were an effectual remedy for the disease; than which, nothing is more unfounded. The condition of the brain may be changed, indeed, by this and other narcotics, and stupor (rather than sleep) induced by them. But the real question to be determined is, have such means a power, or even a tendency, to relieve inflammation in such an organ? Generally speaking, I should say not, but rather the reverse.

In connexion with this subject, I may here allude to what is called (absurdly enough) *delirium tremens.* This state, manifestly a brain-affection, is induced by the long-continued use of intoxicating drinks. A remarkable change has taken place in the minds of practitioners regarding the disease, both in respect to its nature and treatment. Formerly, it was classed with inflammation of the brain, and considered as a mere variety of phrenitis; and it was also treated as phrenitis then usually was treated, that is, by blood-letting and other anti-inflammatory means. Within a few years, however, very different views have been entertained on the subject. It was the late Dr. Sutton, of Greenwich, I believe, who gave the disease the name of *delirium tremens*, and who first suggested a different and even opposite mode of cure to that generally in use before. Blood-letting was condemned, as not only unnecessary, but as positively injurious; and he substituted for it the use of opium in large doses, and even a regulated employment of the very cause that had first induced the disease. And such appears to be the prevailing opinion on the subject at the present time. The notion seems to be, that the affection of the brain, in what is called *delirium tremens*, instead of being inflammatory in its nature, is a state of debility, the result of previous over excitement (the indirect debility of the Brunonian school); requiring, therefore, a regulated administration of stimuli, in order to enable the organ to resume its healthy state of action. The hypothesis involved in these notions is hardly worth your attention; but the practical inference deduced from it is of some importance.

No distinct meaning seems to be attached to the term debility, as applied to the brain in this case. Both the phenomena of the disease, and the nature of the exciting cause, go to show a state of increased arterial action there. That such a repeated excitement of the organ should at length induce a diseased condition of the part, it is quite natural to expect; while the signs of increased circulation about the head, which is the invariable result of the action of this stimulant, prepares one to expect an inflamed state of the brain as the result—an expectation that is verified by the febrile state of the system that accompanies the disorder, as well as by the occurrence of the delirium itself.

The propriety of blood-letting in such a case is quite another point of consideration, which experience only should decide. I have seen and treated numerous cases of the sort (some of them, indeed, members of our profession); and I am prepared to state, with confidence, that blood-letting will be found of the greatest service on many occasions. There is, therefore, no foundation for the opinion that this remedy is adverse in its nature to the disease. But while I say this, I wish you to understand that such a remedy is not generally required, and only where the febrile symptoms are such as to lead to the belief that the inflammation is of an active kind, and where the general strength and other circumstances warrant the adoption of it. In a large proportion of cases it is sufficient to withdraw the patient from the habitual indulgence he had been accustomed to. A gradual abstraction of the exciting cause would probably be advantageous, and preferable to an immediate and total withdrawal of a long-accustomed stimulus. Much advantage, also, may be expected from the use of slightly tonic remedies on these occasions.

But in speaking thus favourably of blood-letting in certain cases of *delirium tremens*, I must add, that in no case is the remedy to be used without great caution, and when used, to a very limited extent only. With this precaution, and under the proper circumstances, you may resort to it without apprehension.

As to opium in these cases, I may remark, that the motive for employing it is little more than imaginary; while I know that it is in many cases unnecessary, the disease terminating well without it. That it is altogether free from inconvenience, or even danger, when employed to the extent often recommended, my observation leads me to doubt. Applied to a moderate degree, it may possibly do good at times.

— The recommendation of blood letting and the prohibition of opium are alike [illegible]. in direct opposition to universal opinion on the treatment of delirium tremens. — But Mr. [illegible] is an author and a man full of [illegible] which he to practice sometimes [illegible] though [illegible] in error.

## LECTURE XIII.

### ON BLOOD-LETTING IN HEMORRHAGE AND DROPSY.

It seems at first rather preposterous to speak of blood-letting as a remedy for hemorrhage or loss of blood; yet such it unquestionably proves to be on numerous occasions. A little reflection on the subject will satisfy you, that there is nothing unreasonable in such a proposal. This admission, you will say, goes to confirm the homœpathic principle of "similia similibus curantur." But as this principle is not more generally true than its opposite "contraria contrariis," the admission tends but little, in reality, to the support of a doctrine that, considered as universal, is full of absurdity.

Hemorrhage may be defined—a preternatural discharge of blood from any part of the body, not the result of injury or mechanical violence. Hemorrhage does not take place indifferently from all parts alike, but is chiefly confined to such as are particularly vascular in structure and delicate in texture; and in which, at the same time, the vessels run superficially.

These conditions are met with in the membrane lining the nostrils and air-passages in general, and especially in the lungs themselves; in the alimentary canal, particularly the extremity of the rectum; in the urinary organs also, which are frequently the seat of this disease; and, lastly, in the uterus, of which hemorrhage may almost be considered as one of the functions.

In order to understand the use of blood-letting in the different varieties of hemorrhage, it will be requisite to consider a little the intrinsic nature of the affection in general, or, what is technically termed, its proximate cause. I must premise, however, that the observations I am about to make, apply to what has been called active hemorrhage, and not at all to those passive forms of the disease (as they have been considered), in which the blood escapes from the vessels; either owing to their want of contractility, or to the imperfect and dissolved state of the blood itself. Blood-letting, it is plain, can have no application to such.

Now hemorrhage, of the active kind mentioned, is essentially a local, not a general affection; for although it is sometimes preceded and accompanied by pyrexia, or a state of general excitement, it nevertheless frequently occurs without any increase of action, or other disorder, either in the heart, or general vascular system. We find it taking place, accordingly, both in the weak and in the strong. Whether the discharge of blood is owing to actual rupture of vessels, or whether it is not attributable (in part at least) to enlargement of the exhaling extremities of the arteries, so as to allow of the escape of blood from them, seems uncertain. It is so often preceded and accompanied by heat, and an increased flow of blood to the part, that it is probable it depends immediately upon an increased action in the capillary extremities of the arteries of the affected part.

The parts peculiarly liable to hemorrhage are the following:—1st, the nostrils, where the disease takes the name of *epistaxis*; 2d, the lungs (*hæmoptysis*); 3d, the stomach, from which the blood is usually discharged by vomiting (*hæmatemesis*); 4th, the general tract of the intestinal canal, a discharge of blood from which, though by no means uncommon, has received no particular appropriate denomination; 5th, the extremity of the rectum (*hæmarrhois*); 6th, the urinary organs (*hæmaturia*); and, lastly, the uterus (*menorrhagia*). Besides these, which are of the most ordinary occurrence, and where the blood is discharged outwardly, hemorrhage may take place internally, and is then only known from symptoms, or by examination of the body after death. Thus the heart may burst, or some of the larger vessels in the cavities of the chest or abdomen give way, so as at times to lead to the immediate extinction of life. And the same occurs still more frequently in the brain, giving rise to apoplexy or palsy, or both, according to the particular seat and amount of the blood extravasated. Now blood-letting, though imperatively demanded in many of these cases, is by no means universally proper, and even where it is called for, attention is always required to be paid to the particular circumstances of the case, in order to determine the degree and manner in which the remedy is to be administered.

Let us first speak of the general circumstances that may either call for, or prohibit its use.

When hemorrhage takes place in persons of full or sanguine habit, and who possess a tolerable share of general strength, when it is accompanied by a febrile state of system (*pyrexia*), and a sense of fulness and distension in and about the part from which the blood flows, or is about to flow, an antiphlogistic mode of treatment is very generally called for, in all respects analagous with that of inflammation, to which, indeed, hemorrhage nearly approaches in its general characters, and into which it often passes. It is here, if ever, that blood-letting is required ; not, however, for the purpose that has sometimes been assigned to it, namely, that of diminishing plethora, but (as in inflammation) with the double object of directly reducing the arterial action of the part ; and, indirectly, upon the principle of counter-irritation, or rather counter-impression, as before explained to you. In such cases, after blood-letting, other means of producing counter-irritation, such as vomiting, purging, and blistering, may be resorted to with advantage ; as well as *astringents*, which have the effect of producing contraction of the capillaries ; and also *sedatives*, for the purpose of allaying vascular excitement, a purpose that is often well answered, both by the digitalis, and the salts of lead.

The notion entertained by many, that hemorrhage is the consequence of plethora, or an excess of blood in the system, leads to uncertain, and even pernicious practice—uncertain, because supposing such a state as plethora to exist, which is at least doubtful, it is impossible to estimate its degree—and pernicious, because it inculcates the employment of blood-letting in many cases to which it is not at all adapted, but rather the contrary. In a late elementary treatise on the Materia Medica, the author remarks "that it is unnecessary to draw blood artifically, because the hemorrhage will cease as soon as the quantity of blood lost brings down the plethoric state which induced it." By acting upon this principle, the patient may be brought into great danger; for we often find hemorrhage continuing, or recurring at short intervals, to an enormous extent, and in spite of the most liberal use of the lancet, till the system is nearly exhausted. Plethora, it is evident, can have no share in keeping up such hemorrhages. But, in fact, the object of blood-letting in hemorrhage is not that of simply diminishing the quantity of blood in the system ; but for checking the action of the bleeding vessels, upon the principle of counter-impression, as before explained. The effect, as in the case of inflammation, depends more upon the mode of drawing than upon the quantity of blood lost. And thus hemorrhage will be checked at times by the sudden loss of half a pound of blood, a quantity that can have no applicable effect in lessening the bulk of the great circulating mass.

When hemorrhage takes place without febrile symptoms, or when these have subsided; and where the system altogether is weak, either originally, or from the continuance of the discharge ; where, again, the pulse is soft and feeble, the skin pale, and the solids soft and flabby, with cold extremities, blood-letting can hardly be either necessary or even safe. In such cases astringents of different kinds, and even the most active general stimulants, are required.

The treatment of hemorrhages varies considerably, according to the part affected; it becomes necessary, therefore, to speak of them individually; for blood-letting is not equally adapted to all.

In epistaxis, local remedies are of more avail than general ones. Blood-letting is not called for unless there be much throbbing of arteries within the head. Cupping from the back of the neck may, however, be useful, upon the principle of counter-irritation; as also purging and blistering upon the same principle. Should the application of cold to the face not have the desired effect, the snuffing up some active stimulant, such as alcohol, a little diluted, or inhaling the vapour of ammonia, or of the oil of turpentine, would be likely to succeed. Plugging the nostrils is another, though uncertain mode of restraining the hemorrhage. Sometimes the bleeding orifice is so low down as to be closed by simply compressing the nostrils.

In the treatment of hæmoptysis, blood-letting is often injudiciously administered, and without sufficient discrimination. You should consider the object to be attained by its use, before having recourse to it at all. Bleeding can only restrain hemorrhage from the lungs, either by lessening the vascular action in general, or that of the lungs in particular. But the general vascular action is not always increased in cases of pulmonary hemorrhage: and bleeding, therefore, is not necessarily required for such a purpose. In almost all cases of hemorrhage from the lungs, there is more or less of disorganization, the result of previous inflammation, and which is the real source of the danger to be apprehended. The object of bleeding is to relieve this, and not merely to repress the hemorrhage, which, of itself, is in most cases of little real importance, and if not going to excess, tends rather to give relief. There is generally an unnecessary degree of alarm felt in these cases, and which frequently leads to improper practice. It is very rare, in cases of hæmoptysis, for the hemorrhage to go to a dangerous extent. In a few instances, no doubt, it proves immediately fatal, by the blood being poured out so rapidly as to fill the bronchial tubes, so as to occasion suffocation. But such a circumstance cannot be foreseen, nor has blood-letting any power to relieve it. It is not an uncommon practice, in cases of hemorrhage from the lungs, to expose the naked body of the patient to cold air: or to apply cold water, or even ice, to the surface of the chest. But the effect of this is, by contracting the external vessels, to throw the blood in greater quantity upon the lungs, so as to produce distension of vessels there—a most likely cause of increasing the hemorrhage at the moment, and of aggravating the local inflammation afterwards. It would be far more advisable to keep up an equable circulation, by friction, external warmth, and even the use of internal stimulants—a practice that I have often seen successful, and the good effect of which is enhanced by making the patient breathe an artificially-cooled atmosphere; as by inhaling from a vessel containing ice.

It is not foreign to the purpose to remark here, that I much question the utility of confining phthisical patients to close apartments, for the purpose of breathing a regulated atmosphere; and that at rather an elevated temperature, as is usually the case. The general circulation is thus liable to be increased, and the hectic disposition aggravated; than which, nothing is more likely to accelerate the progress of the disease. It is doubtless an advantage to preserve an equal circulation over the whole body, with the view of preventing a disproportionate accumulation of blood in the lungs: but this, according to my observation, is best accomplished by warm clothing, and the use of substantial food, as the appetite may require. Nor is the moderate use of stimulants objectionable in such cases, in the winter season. Now while the general circulation is thus maintained, *in equilibrio*, that of the lungs themselves should, as far as possible, be restrained—an object that is best attained by the inspiration of cool air. If, therefore, the patient is to be confined to a regulated temperature, the air he breathes should be as cool as is consistent with his comfortable feelings, so as to avoid a sense of chilliness. But I am inclined to believe, from observation, that a much greater latitude than is usually conceded might be adopted in these cases, not only without disadvantage, but with benefit to the patient upon the whole. Over-great care generally defeats its own purpose; by increasing the susceptibility of the body to all impressions. I think I have observed that those phthisical patients do best upon the whole, who are the least fastidious in regard to atmospheric exposure, as well as various other supposed noxious agents. I have known a phthisical patient bathe daily in the open sea throughout the winter, and, according to his own conviction, with decided benefit. It is true that the disease, in this instance, as is too generally the case, proved ultimately fatal; but after a longer duration, and apparently with less suffering, than in most other cases I have witnessed.

As an important part of the treatment of phthisis pulmonalis, and of hæmoptysis also, as a frequent attendant on this, I would strongly recommend the inhalation of an artificially-cooled atmosphere in the manner I have just hinted at; and that repeatedly in the course of the day. If this, with other parts of the regimen before described, be had recourse to, you will have little occasion for, or rather, I should say, may advantageously dispense with, a farrago of drugs that are usually employed in these cases; always excepting, however, the digitalis, and an occasional small bleeding, the advantage derivable from both which, as sedative or antiphlogistic means, are easily understood, and cannot well be over-rated.

*Hæmatemesis*, or vomiting of blood, seldom occurs spontaneously, unless in the rare case of its being vicarious with menstruation. It is mostly the effect of organic disease of the stomach itself, or of some neighbouring part, and which, of course, is the result of slow and destructive inflammation. The organic mischief, wherever seated, is of so low a growth, and so commonly accompanied by general weakness, that there is seldom any call for blood-letting, and only as an occasional palliative. Much the same may be said of a discharge of blood from the intestines. The blood discharged in these cases is usually dark-coloured, and sometimes nearly black (*melæna*), from its long remora in the canal previous to its discharge. Affections of this sort, of long standing, as they commonly are, seldom require or admit of blood-letting.

Hemorrhoidal affections attended by loss of blood (as the name implies), are so generally accompanied by local disease in the part, without disorder of system, that local remedies, including topical bleeding, are, for the most part, all that is required.

Hemorrhage from the kidneys seldom occurs, except as the result of the presence of renal calculi; to which blood-letting has no application, unless from the casual combination of active inflammation.

*Of Uterine Hemorrhage.*—Uterine hemorrhage is distinguished from epistaxis and hæmoptysis, by the muscular contractility possessed by this organ; the uterus, a circumstance which on many occasions materially influences the result of the disease. Thus, when the uterus is in a distended state, as in pregnancy, and the blood-vessels have become enlarged in consequence, the contraction of the organ tends to compress the vessels, and thereby to restrain the bleeding from them. In all cases, therefore, of uterine hemorrhage, occurring in such circumstances, it is of importance, when otherwise practicable and proper, to remove the distending cause, so as to allow of the contraction of the uterus taking place. On this ground, it is often found necessary to effect the removal of the fœtus, or of the placenta, where this happens to be retained. The obstacle to the contraction of the womb being thus removed, the contraction itself may be promoted by appropriate means; such as pressure over the abdomen, the application of cold, and mechanical irritation of the os uteri itself. Now I hardly need observe, that this is not a case of hemorrhage in which blood-letting can generally be required. But all this involves a variety of considerations, with which we have here no concern. In other cases of uterine hemorrhage, unconnected with gestation, the propriety of having recourse to blood-letting must, of course, be determined by the circumstances present. These may be such as to require the use of this remedy; as where the habit is strong, and signs of inflammation exist. But where the general strength is exhausted from the long continuance of the hemorrhage, a different treatment is required: of which the following case affords an instance:—A woman, after suffering a miscarriage, had frequent returns of hemorrhage during seven weeks, when I first saw her. She had been bled freely and repeatedly, and the usual astringent remedies had been employed, but without the desired effect. She had become pale—the pulse was soft and weak—and the extremities cold. Three drachms of the compound Tincture of Cinnamon, with one drachm of the Spiritus Ammoniæ, a little diluted, were given every four hours. This excited much feverish heat and thirst. The hemorrhage soon ceased, and did not again recur. I have used the Ol. Terebinth. in other cases of the sort, with equal advantage. Some practitioners, I may observe, have recommended a large use of opium, in cases of uterine hemorrhage immediately following parturition; but upon what just grounds it is difficult to perceive. Opium is powerful in lessening the disposition to muscular action in general, and so far seems calculated to prevent that contraction of the uterus which is the chief means of suppressing the hemorrhage in such cases.

An equal objection, as I think, applies to the use of brandy or other spirit, which it has been the fashion of late to administer to an enormous extent to patients so circumstanced. Now alcohol, when largely employed, has nearly the same effect as opium in diminishing muscular power. They are both narcotics. And although spirit appears to be more stimulant, with respect to the action of the heart and sanguiferous system altogether, its effect in this way is not lasting, nor can it be kept up for any length of time; so that no permanent advantage is gained by it. An appeal is made to experience here, as deciding in favour of the practice. But nothing is so fallacious as what is called experience. It is, in fact, little more in general than individual opinion, and practitioners, I know, are much divided on the subject. All I wish to say is, do not hastily adopt opinions on this or any other subject.

## *Of the Use of Blood-letting in Dropsy.*

As with regard to most other medical subjects, you will find a great and lamentable diversity of opinion among writers, not only with respect to the supposed nature and mode of production of dropsy (what we call the theory of the disease), but, which is of far greater moment, the treatment proposed for its relief. Thus, the notion of debility is almost universally coupled with dropsy; in consequence of which, blood-letting, as a debilitating power, is particularly dreaded, not merely as incompatible with the nature of the disease, but as tending, in fact, to its production. Under this apprehension, the use of this remedy is avoided on numerous occasions where it is urgently required. On the other hand, it is sometimes asserted that bleeding cures dropsy. But neither of these opinions is true in the abstract. Bleeding has no direct tendency to produce dropsy; nor, on the other hand, does it directly cure the disease, although its employment is often strongly called for. To understand all this, we must look a little to the origin of the disease, and the manner of its production.

Dropsy is a preternatural accumulation of serous fluid in any of the cavities or interstices of the body; and, of course, the seat of it may be very various. It may take place, for example, in any of the close cavities of the body—as the abdomen, thorax, or cranium; as well as others, which it is needless to particularize, because the same general principles apply to all of them. These have been sometimes termed encysted dropsies, in order to distinguish them from that diffused or cellular species where the fluid is lodged in the cellular or reticular membrane that connects the skin with the subjacent parts, and contiguous organs with each other. This variety of dropsy only differs from the former, by the circumstance of the fluid readily passing from one part to another, by gravitation or pressure, in consequence of the free communication that exists between the different parts throughout the whole cellular structure.

Now there is constantly going on, in health, a secretion or exhalation of fluid from all surfaces mentioned, in quantity just sufficient to keep those surfaces moist; while the fluid thus thrown out is as constantly taken up again by the absorbents, and carried into the veins, by a route which you are of course acquainted with. Thus, exhalation and absorption are balanced, and there is no accumulation in any of the cavities or interstices of the body. But if either of these functions should be materially disturbed, so that exhalation should much exceed absorption, accumulation necessarily takes place, and dropsy is the result. So far, there is no uncertainty; but with regard to the precise way in which the accumulation takes place, in different instances, there is much difference of opinion; and as the question of treatment, especially in regard to the use of blood-letting, becomes involved, we must go further into the inquiry.

There are different ways in which the accumulation may take place in dropsy. For instance, exhalation may be morbidly increased, absorption continuing as before: in this case, the exhalents are in fault. Or exhalation taking place in the ordinary degree, absorption may be defective. It may even happen that both exhalation and absorption are either in excess, or deficient, at the same time; and yet, provided the former exceeds the latter, accumulation will be the consequence. These, however, are cases that can hardly be distinguished in practice. But it is of consequence to determine, in a general way, whether, in any particular instance, the dropsical accumulation is owing to increased secretion or exhalation, or to diminished absorption; for the treatment will differ widely, according as the one or the other happens to be the immediate cause of the accumulation. In order to determine this, we should inquire into the causes and circumstances that can occasion either increased exhalation or diminished absorption; for the treatment must be adapted, as far as possible, to the one or the other, as it may happen to prevail.

The most frequent cause of increased exhalation from surfaces appears to be the increased circulation that not merely accompanies, but seems to make an essential part of inflammation. There are, indeed, very few cases of dropsy where a connexion with, and dependence upon, inflammation may not be distinctly traced; of which, thoracic dropsy, both of the pleura and pericardium, affords the most striking proof. This is scarcely less obvious in regard to the cavity of the skull; where inflammation of the membranes obviously lays the foundation of all the more acute forms of hydrocephalus. In the abdomen, also, the same will be found, upon careful inquiry, to be the case; and if the presence of inflammation is less obvious here than in the thorax and cranium, it is because the functions that are carried on in the abdominal cavity are not so immediately important to life as in the other cases; the symptoms altogether are, therefore, less urgent, and less striking. The same effect of inflammation in producing increased exhalation is observed with regard to the cellular texture in general; much of the swelling that takes place on such occasions being attributable to this circumstance.

But it is not the most acute degree of inflammation, in any case, that has this effect: adhesion of the inflamed surfaces more commonly then happens, and the cavity is in consequence wholly or partially obliterated; while, in the case of the cellular membrane, the part is condensed and indurated, so that the natural texture is destroyed.

Now it is in dropsies connected with inflammation, in the way I have just described, that blood-letting, as well as other antiphlogistic remedies, is occasionally called for. In all cases of dropsy, therefore, that are submitted to your care, you should inquire first, whether they are founded in inflammation, and whether the inflammation still exists; and, secondly, whether the stage of the disease, as well as the other circumstances of the case, are such as to justify the use of this remedy.

The determining the former question is seldom a matter of much difficulty. The signs, both local and constitutional, of existing inflammation, are, in general, too obvious to be mistaken. With respect to the latter, or constitutional signs, much stress has been laid of late years upon the circumstance of the presence of albuminous matter in the urine of dropsical subjects, as serving to show the particular character of the dropsy, and as affording indications with regard to the treatment. But the albuminous state of the urine is not peculiar to dropsy; it is rather characteristic of certain degrees of inflammation, whatever the organ be that is so affected. Nor is it decisive as to the employment of antiphlogistic means of cure—at least of blood-letting—for this must be governed by a general view of the circumstances of the case, as I have frequently before pointed out.

Much, also, has been said and written of late about a peculiar change of structure in the kidneys, and which consists chiefly in a granulated texture of the organ. This was first, I believe, particularly noticed by Dr. Bright, and is now familiarly termed by the writers, "Bright's kidneys," such a degeneration of the structure being supposed the immediate cause of the secretion of albuminous urine. But there are many objections to this hypothesis, and which have been particularly pointed out by Dr. Graves, of Dublin, in his clinical lectures as recently published in the Lancet.* In the first place, an albuminous state of the urine may exist without such a condition of the kidney: and where it really exists, the urine at one time presents the albuminous appearance, while at another this is wanting. Albuminous matter is deposited, also, in the different cavities of the body in dropsy, as well as occasionally secreted by the kidney. The connexion, therefore, that is contended for between "Bright's kidney" and albuminous urine, can hardly be maintained. As far as I have observed, the presence of albumen in the urine is only found where febrile symptoms are present; and as the febrile state is always the result of inflammation, such a state of the urine serves only to prove the frequent connexion of dropsy with inflammation as its most general source.

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* See the Lancet for October 20, 1838.

Supposing, then, that either by local or general signs the existence of inflammation is shown in any case of dropsy, we have to determine the propriety of bleeding by the stage of the disease and the general condition of the patient, in respect of his general strength and other circumstances, just as in ordinary cases of inflammation. If the disease is recent, and the habit tolerably strong, blood-letting is not only objectionable, but highly useful, and even often indispensable to the cure. It is in hydrothorax, perhaps, more than in any other variety of dropsy, that the inflammatory character is the most marked, and the advantage of blood-letting most frequently and distinctly seen. It is not a large abstraction of blood, however, that is wanted, nor, in fact, would such be safe. The irritability of the heart is so morbidly changed in these cases by the inflammation, that any great disturbance of its action, such as a large or sudden abstraction of blood is likely to produce, might prove immediately fatal. This does not apply to the deliberate loss of from four to six ounces, which, under the favourable circumstances mentioned, seldom fails to be followed by decided relief; while, provided the stomach is capable of performing its office well, many repetitions of the evacuation, with a few days' interval, may be borne with perfect safety, and, in not a few instances, with an absolutely curative effect, as I know from experience.

Many cases of general anasarca arise from thoracic inflammation, as is clearly proved by the symptoms: and the way in which the dropsy takes place is probably this: the thoracic duct becomes obstructed, either by participating in the inflammation, or from being pressed upon by the swelling of the neighbouring parts. The necessary effect of this is, first, impeded transmission: and, next, a cessation of the process of absorption. Blood-letting probably effects the cure of such a disease by putting a stop to the thoracic inflammation, the swelling produced by which gradually subsides afterwards. Such a gratifying result I have often witnessed in recent dropsies of this description.

Cranial dropsy, when recent, is also very generally accompanied with signs of inflammation, this being in reality the foundation of the effusion, as it is termed. A cautious antiphlogistic treatment is the only one likely to prove successful.

A not unfrequent variety of dropsy is that which follows scarlatina. This probably results from the previous inflammatory state of the skin and subjacent cellular texture, just as happens in various other inflammations. It is usually observed upon the decline of the febrile symptoms, but often before they have wholly subsided; arguing, therefore, a continuance of the inflammatory state. The idea of debility has been attached to this kind of dropsy as to most others; and tonics and stimulants of various kinds have been liberally administered, in accordance with this notion. This practice has generally appeared to me not only useless, but injurious, by aggravating the febrile symptoms, and keeping up the inflammatory state of the subcutaneous membrane. Generally speaking medicine is superfluous in these cases, the disease gradually and spontaneously disappearing. If, however, the febrile symptoms run high, and the tongue is foul and dry, a small bleeding or two, in proportion to the strength of the patient, with purgatives and the digitalis, are of essential service.

You may easily transfer the mode of reasoning here employed to other varieties of dropsy, so as to deduce from it the proper mode of treatment. It is but too true, that few cases of dropsy are, or can be, cured. The reason is, that the disease in most instances is accompanied with so much visceral disease, as to defy the power of art. Much, however, of our want of success in the treatment of dropsy is owing to the neglect of inflammation in its early stage. Prompt and active blood-letting prevents dropsy in numerous instances, by putting a stop to the inflammation, which is, in a large proportion of cases, the real origin of the disease. Properly speaking, bleeding does not cure dropsy itself, but effects its purpose by removing the general cause—to wit, inflammation. I have never seen reason to believe that blood-letting, to whatever extent it be carried, produces real dropsy. The notion is, that it impoverishes the blood, rendering it more watery in consistence, and so thin as to be incapable of retention in the vessels. Now that repeated loss of blood changes the relative proportions of the component parts of the mass is no doubt true; the serous parts becoming augmented, while the crassamentum is diminished in proportion; and so far the blood presents a more watery appearance. But there is a fallacy here. On many trials, I have found that the abundant serum in these cases coagulates as entirely by heat and other agents, as it does where it makes a smaller proportion of the mass, which is therefore not so watery as it looks. There is less of fibrin, but not less of albuminous matter present. That dropsy, therefore, is producible to any formidable extent by blood-letting, I am inclined from observation to deny. An *œdematous* state of the lower extremities may thus take place in a slight degree, not owing, however, to the circumstance mentioned, viz. a more watery state of the blood, but to a weaker action of the absorbent vessels, by which the return of lymph from the extremities is impeded. This is seldom observed but in the lower extremities, and chiefly after they have remained for some time in a dependent position.

Upon the whole, you need not be deterred from the employment of blood-letting in any case of active inflammation, from the apprehension of its inducing dropsy; this disease, on the contrary, often arises from the neglect of it.

Some have ascribed dropsy to a torpid state of the capillaries, allowing fluid to escape from them in greater quantity than the absorbents can take up.* Upon this ground we are directed to stimulate the capillaries to greater action; and the means recommended for the purpose are calomel, blisters, and the digitalis. But the fluid in dropsy does not ooze out from the pores or extremities of the vessels, but is the result of secretion, which is a vital process, and likely to be retarded rather than promoted by a diminution of action in the capillaries. The means of cure here alluded to may no doubt be useful on some occasions, though not upon the principle supposed. The digitalis seems strangely classed with stimulants, for the purpose of exciting the action of the capillaries; but then it is said, in the way of explanation, that digitalis is a stimulant at first, but that when it is accumulated in the system to a certain extent, then it becomes a direct sedative. This to me, I confess, is not very intelligible.

I mentioned that dropsy, though generally the result of increased secretion or exhalation (as when it arises immediately as a consequence of inflammation), nevertheless is in some cases owing to deficient absorption, or—which soon comes to the same thing—impeded transmission of the lymph from obstruction of the absorbent vessels. This I instanced in the case of inflammation in the chest producing obstruction in the thoracic duct. A similar cause of obstruction may occur in other parts of the absorbing system, and with similar effect. The removal of the obstructing cause, whatever it be, is for the most part essential to the cure of such dropsies; and blood-letting is only applicable so far as it is capable of removing such cause. This you will readily understand from what has been already stated.

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* See the account of Clinical Lectures delivered at the North London Hospital, by Dr. Thomson, Professor of Materia Medica in University College; Lancet, Jan. 4, 1838.

THE END.

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